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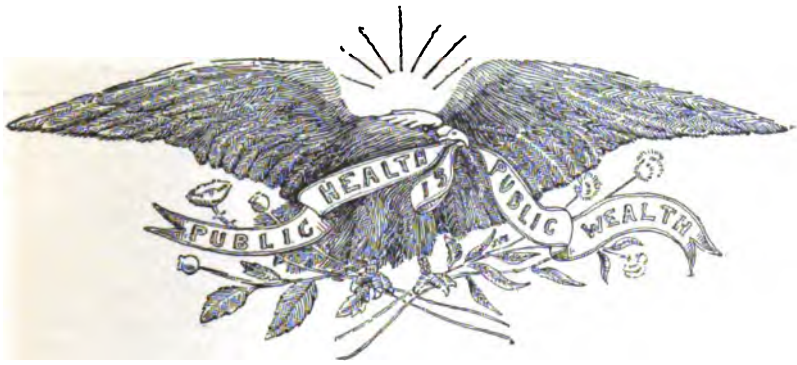

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A. N. BELL, A.M., M.D., Editor.

T. P. CORBALLY, A.M., M.D., HARRY KENT BELL, M.D., } Associate Editors.

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AIR AND ITS PROPERTIES AS RELATED TO HEALTH.

By A. N. BELL, A. M., M. D.

Knowledge of the air we breathe, and of the boundary lines between that which is wholesome and that which is not; knowledge of air so impure as to be wholly unfit for respiration, and knowledge of the difference between it and that which is poisonous is everywhere essential to the maintenance of health.

It is even more important to know the quality of the air we breathe than of the water we drink. More necessary to be mindful of the medium in which we are constantly immersed and which is continually being introduced into our blood and passing through our bodies, than it is of that which is only occasionally and by some persons rarely introduced into the stomach, which contains a fluid possessing antiseptic and destructive power over substances injurious to health. Moreover, the consequences of exposure to impure air are more insidious and obscure, and more persistent than those of impure water.

The train of evils set in motion by breathing impure air is generally so insidiously laid as to frequently escape the observation of experienced physicians. Drowsiness, headache and nausea are the more common effects observed under occasional conditions. But these are insignificant as compared with the results common to habitual breathing of air fouled by the products of respiration alone—wholly apart from external sources of pollution. Malnutrition, dyspepsia, anæmia, disordered biliary functions and many indefinite chronic complaints from alleged unaccountable causes are common consequences of breathing impure air, which, besides all these, is predisposing to the most prevalent and the most fatal of all diseases, tubercular consumption. For, attribut-

able though tuberculosis is to a specific organism, the effect of habitually breathing air surcharged with putrescible effluvia by re-respiration is, of all conditions and circumstances, the most potent, predisposing cause to it; and not to tuberculosis only, but to acute lung affections, bronchitis and pneumonia in their most fatal forms.

Air is the first condition of life and the first element of our bodily tissues, but to be healthful and life-sustaining it must be devoid of impurities. By respiration alone air supplies three-quarters of our nourishment; and the other quarter, which is taken in form of liquid and solid aliment, consists of substances chiefly composed of the same elements as air.

Pure air principally consists of two ingredients, *oxygen* and *nitrogen* in the proportion by volume, of twenty-one per cent. of the former to (including *argon*) seventy-nine per cent. of the latter, and these proportions have been found to exist whencesoever taken, whether from the summits of the highest mountains, from sandy plains, or from over the sea. But more explicitly and besides these two gases atmospheric air always contains varying quantities of water-vapor, small quantities of carbon dioxide (3 to 4 volumes per 10,000), and traces of ammonia.

As the sum of numerous analyses the atmosphere is composed of: Oxygen, 209.6 per 1,000 volumes; nitrogen (including argon, about 1 per cent.) 790.0 per 1,000 volumes; carbon dioxide, average, 0.4 per 1.000 volumes; water-vapor, variable with temperature, mean, 0.84 per 1,000. Traces of ammonia; ozone, occasionally; peroxide of hydrogen; nitrous and nitric acids; salts of sodium and other mineral substances; organic matter, dead and living, and "dust" of substances variable and innumerable.

The gases of which the air is composed exist in the form of a mechanical mixture not chemically combined. Nevertheless the chief elements are so intimately mixed and yet so fixedly proportioned in the free atmosphere as to be invariable.

The atmosphere is subject to a law which characterizes all elastic fluids, namely: It presses equally on all sides, and when any portion becomes lighter than the others the denser portions rise into its place and force it to seek a rarer medium, always creating a current from the point of greatest to that of the least pressure. When the disturbing cause is local, transient and irregular, partial derangement ensues on account of the action necessary to cause a speedy adjustment. But as the local disturbances are always as much wanting on one side as they are in excess on the

other, they are equivalent to undulations of the same medium. Their balance will still maintain an equality of pressure; and whatever may be the disturbing causes the restoration of the equilibrium is the object of all the motions excited. In the free atmosphere its own weight is a compensating force, hence both its weight and elasticity diminish in ascending from the ocean level.

According to a natural law all gases tend to diffuse themselves through each other, irrespective of their specific or relative gravity. The action of this law is promoted by the wind, but it operates even in confined places; insomuch that in crowded rooms, especially if they are warm, carbon dioxide—the heaviest of the atmospheric gases—is frequently found more abundant at the ceiling than at the floor.

The atmosphere rotates with the earth upon its axis and consequently in its upper regions, and over the equator especially, it is hurled with incalculable swiftness and to the uttermost degree of attenuation. Penetrated by the sun's rays and in conjunction with the heat at the surface of the earth it is rarefied and acquires accelerated motion and gives rise to winds, varying in force from the gentlest breeze to the raging tornado. And so complete is the agitation by the continual disturbance going on in the lower regions by these forces that no difference has ever been discovered in the proportion of the essential components of the atmosphere at the various elevations at which it has ever been possible to collect it for analysis.

The winds are a fertile source of health because they serve to equalize the temperature, to scatter pernicious effluvia and condensed vapors which would otherwise accumulate in fortuitous places. But their immediate effects are favorable or unfavorable to health according to the region from which they set out or pass over. The northeast winds of the Atlantic States are damp and unhealthful because they sweep down the fog and mists of a northern seashore more or less loaded with putrescible matter. The southerly and southwesterly winds are commonly clear, relatively dry and healthful because they are from warmer latitudes and from the pure surface of the ocean. *Sea air* is, indeed, the type of purity and promotive of health; pure water-vapor is its only isolation. The deposit of salt on the sails and on shipboard is chiefly from the spray and not from the air. However, the salt of the sea is borne to some extent by strong winds, and in seashore regions it is inhaled. But considering the small amount and

the perfect solubility of such infinitely small particles of pure sea-salt, in the fluids of the system, it is not incompatible with the most delicate organic function under any circumstances. The ill effects sometimes ascribed to sea air are usually owing to the want of ship ventilation and disregard to cleanliness.

The processes of respiration and combustion are perpetually tending to destroy those nicely adjusted proportions of the gases of the atmosphere. But their natural tendency to rapidly permeate each other and become equally diffused is so great that the polluted air is not allowed to accumulate, but rapidly diffuses itself; while the vital air rushes, by counter tendency, to supply whatever deficiencies take place. Hence the universal constancy of the atmospheric elements.

The life-sustaining element of true air is *oxygen*, a colorless gas without odor or taste. Oxygen is the most generally diffused element in nature. For besides constituting one-fifth of the bulk of the atmosphere and one-third of the bulk of water it is a component of almost all the earths and minerals found on the surface of the globe, and is a universal constituent of all animal and vegetable substances. At every moment of living existence the animal is taking oxygen into its system by respiration. Submitted to animals in its pure state, they breathe it at first with evident delight, but it greatly excites them, quickens the vital processes to such a degree as to throw them into a state of fever and finally kills them by excess of excitement. On the other hand, if an animal be placed into the residue of the air—that from which the oxygen has been abstracted—it suffocates instantly, without the power to take a single breath. The availability of oxygen for life and health depends upon its dilution with nitrogen in the proportion of not less than one part to four, per volume.

The quantity of oxygen consumed in respiration varies according to the condition of the system. Approximately a human adult consumes half a cubic inch of oxygen at every breath. The quantity may be increased by muscular exertion to fourfold what it is in a state of repose. If the exertion is excessive, however, so as to induce fatigue, the consumption of oxygen is diminished. The quantity consumed is also affected by temperature and diet. More is required at a low than at a high temperature, and by persons who chiefly live on animal food rather than those who subsist on vegetables.

The average capacity of the lungs of an adult person for air is about three hundred cubic inches; and when the lungs have been

inflated, by the first respiration of the babe, they are never again destitute of air to the end of life. The constant residuary amount of air in the lungs is about one-third of their cubic capacity. By respiration this residuary air is alternately augmented and diminished, and, by the diffusion of gases, the whole quantity is renewed by about every ten respirations of pure air. The half a cubic inch of air that disappears every respiration is wholly oxygen. It is replaced by a relative proportion of carbon dioxide, exhaled.

The average amount of oxygen thus consumed by a healthy adult person being half a cubic inch every respiration, amounts in a day to about fifty thousand cubic inches, or more than twenty-five cubic feet. Now, as oxygen constitutes but one-fifth of the volume of the air, a single adult person renders not less than one hundred and twenty-five cubic feet of air unfit for respiration every twenty-four hours. What becomes of the enormous quantity of oxygen thus introduced into the system? It is in part returned to the atmosphere in the form of carbon dioxide and the vapor of water. And since no part of the oxygen taken into the system is otherwise given off, and as the carbon and hydrogen are supplied in the food, it is evident that the amount of nourishment required by the animal body to maintain it in health must be in direct ratio to the quantity of oxygen inhaled.

Ozone is intensified oxygen; oxygen in allotropic form; a variation in physical properties without change of substance. Ozone, though a normal constituent of the atmosphere, is far from being always present; and is never present in the air of populous places, of occupied rooms, or over foul soil. It has a remarkably strong affinity for putrescible matter; it is a deadly germicide and a most powerful oxidizing agent; hence its absence from air that is charged with putrescible matter of one kind or another is explicable by this property. Moreover, this property has been rendered available for the sterilization of water and the purification of sewage.

Ozone is most frequently present in the atmosphere of the ocean, in or near forests and in mountainous regions distant from dead and decomposing matter. It is generally formed during thunder storms, and is sometimes so abundant in favoring regions as to be irritating to the respiratory mucous membranes, causing sore throat and predisposing to bronchitis and pneumonia. Its presence in the air of any place indicates the absence of putrescible

matter; it is thus indirectly a proof of purity. But it is very doubtful whether ozone itself is beneficial to animal life.

Nitrogen is distinguished by its negative qualities. It is frequently called *azote,* from two Greek words, which signify inability to support life. A burning taper is instantly extinguished in this gas, and an animal soon dies in it, not because the gas is injurious, but from the deprivation of oxygen. Its function in the atmosphere appears to be only that of a diluent of the oxygen, reducing its strength and regulating its activity.

Argon and its congeners, recently discovered, are allied with nitrogen; and so far as yet known, like it, inert.

Carbon dioxide is like oxygen and nitrogen in being devoid of color, but unlike them in that it possesses a slightly pungent odor and a perceptibly sour taste. Besides, it is a compound substance of two elements, carbon and oxygen (CO_2); and although universally present in the atmosphere in the average proportion of 0.4 per 1,000 volumes, it is liable to exist in variable and dangerous proportions in circumscribed places. It is constantly given off in the process of animal respiration and is always produced when carbon in any form or any compound of carbon is burnt with a free supply of air. It is non-inflammable and irrespirable. An animal immersed in it dies instantly. Even when greatly diluted with air it cannot be respired for any length of time without producing insensibility. Air containing more than its average normal proportion is always detrimental to health. It acts upon the system as a narcotic poison, hence the danger of crowded and ill-ventilated quarters.

The weight of carbon dioxide as compared with the other gases of the atmosphere is about one-half greater. This fact suggests at first thought that carbon dioxide ought always to be found in larger proportion on the surface of the earth, and nearer the floors of ill-ventilated buildings than the ceilings. But the truth is that although carbon dioxide is the heaviest gas of the atmosphere it is quite as abundant in the air at the greatest elevation at which the atmosphere has ever been examined, as it is at the surface of the earth; and in crowded and illy ventilated buildings, particularly if they are warmed, it is frequently more abundant at the ceilings than at the floors. This is due to the natural law of gaseous diffusion before referred to.

The quantity of carbon dioxide thrown off by respiration, like the consumption of oxygen, varies according to circumstances.

It is doubled in the same person in passing from a temperature of ninety-five degrees to sixty-five; and in the same ratio as temperature diminishes. During active exercise and after full meals the quantity of carbon dioxide exhaled is much increased. On the other hand the quantity is diminished by repose and sleep. The quantity also differs somewhat according to peculiar conditions of age and sex.

The amount of vapor retained in the atmosphere varies with the temperature, and more or less with relation to surface conditions—sea and land, arid and wooded regions, altitude and sea levels, geographical positions, the seasons and prevailing winds. But at the same temperature and under the same pressure the maximum quantity is invariable. It is rarely less than one two-hundreth, or more than one-sixtieth of the volume of the atmosphere anywhere, and gives a mean ratio of 0.84 of the volume. Excessively dry air, as it frequently is over arid regions and high altitudes, where there is but little rainfall, and in schoolhouses and other inhabited buildings heated by radiators or hot air furnaces, without adequate provision for fresh air and moisture, devours moisture of the nostrils and eyes and is a frequent cause of catarrh, bronchitis and ophthalmia.

Excessive moisture of the atmosphere apart from unclean local conditions, as it is over the ocean and commonly in pine forests, as compared with that of high altitudes and arid regions, is not by itself insalubrious. But such air has a powerful affinity for organic matter in process of decomposition, which process it retards and thus promotes conditions congenial to the cultivation and propagation of microbic organisms. Hence in estimating the relation of atmospheric humidity to health, the condition of the locality with relation to putrescible matter in the soil, or roundabout, should be always considered. And with special reference to assemblies, in schoolhouses, churches and halls, it always should be borne in mind that the exhalation of vapor by respiration adds to the danger of crowds in close quarters. Expired air is loaded with vapor—that is to say, it is completely saturated. The absolute amount added to the air by respiration with the temperature and the quantity of vapor already existing in the air before it is respired; but under ordinary conditions at a temperature of from 60° to 70° F., and the relative humidity of the air being not above 75 per cent. of saturation, an adult gives off by the lungs about half an ounce, and by the skin an ounce of water-vapor hourly. By analysis one thousand parts of vapor thus exhaled by the

lungs contain pure water, 907 parts; carbon dioxide, 90 parts, and animal matter, 3 parts. And such air in thoughtless crowds is sometimes respired again and again!

The amount of air respired by an adult individual daily, under ordinary conditions, is about 400 cubic feet. It contains four or five per cent. less oxygen; four or five per cent., or one hundred times more carbon dioxide than it contained before it was respired; it is saturated with water-vapor—no matter how dry it may have been when taken into the lungs—and a quantity of putrescible animal matter estimated at about three parts in every 1,000 parts of the water-vapor exhaled. Brown-Sequard and d'Arsonval reported in 1888, as the result of several experiments, that the condensed liquid from expired air contains a volatile poison resembling a ptomaine; and if a cubic centimetre of the liquid be injected into a rabbit it quickly dies. Earlier observers have recorded similar results by enclosing animals in glass cases, absorbing the carbon dioxide produced, and supplying oxygen; yet death ensued. Nevertheless, more recent investigations upon this point by Haldane and Smith, at Oxford, indicate that the results of the experiments of Brown-Sequard and d'Arsonval must be capable of some other interpretation than that expired air contains organic matter which is of the nature of a volatile poison. Their chief conclusions are to the effect that (1) the immediate danger from breathing air highly vitiated by respiration arises from the excess of carbon dioxide and deficiency of oxygen, and not from any special poison; (2) that any hyperpnœa which ensues is due to excess of carbon dioxide and not to the corresponding deficiency of oxygen; the hyperpnœa usually appears when the carbon dioxide is present to the extent of from three to four per cent.; (3) that the frontal headache so commonly produced by vitiated air is due to the excess of carbon dioxide; (4) the hyperpnœa from defect of oxygen begins to be appreciable when the oxygen in the air breathed has fallen to a point which appears to differ in different individuals. Similar conclusions have been formulated by Bergery, Weir Mitchell and Billings, as the result of their inquiry into "the composition of expired air and its effects upon animal life." They believe that the discomfort produced by crowded, ill-ventilated rooms, in persons not accustomed to them, is not due to the excess of carbon dioxide, nor to bacteria, nor, in most cases, to dusts of any kind. The two great causes of such discomfort, though not the only ones, are ex-

cessive temperature and unpleasant odors. These odors which are perceptible to most persons on passing from the outer air into a crowded, ill-ventilated room may be due in part to volatile products of decomposition contained in the expired air of persons having decayed teeth, foul mouths, or certain disorders of the digestive apparatus, and in part to volatile fatty acids produced from the excretions of the skin, and from clothing soiled with such excretions. The direct and indirect effects of odors of various kinds upon the comfort, and perhaps also upon the health of men are probably more considerable than are indicated by any tests now known for determining the nature and quantity of the matters which give rise to them.

Altogether the weight of evidence is that the quickly fatal effects of close and unventilated quarters is due to the excess of carbon dioxide and the diminition of oxygen, and not to the animal matter, which, though doubtless poisonous, is less rapidly so than the deprivation of oxygen and excess of carbon dioxide.

In ordinary respiration in the open air the force with which we expire tends to keep the respired air for a time in suspension. But for this force the carbon dioxide would fall from its greater specific gravity than the other gases. The water-vapor suspends the animal matter, pure air commingles with the whole, the vapor condenses and falls or disperses according to the atmospheric temperature, and the animal matters continue to float, fall, oxidize and decompose according to the conditions and plenitude of the surrounding medium.

In crowded and illy ventilated or artificially lighted quarters, and in dense outdoor assemblies this disposition of respired air is retarded or varied. Carbon dioxide emitted by burning gas lamps or candles is not more than half as heavy as the air, and it readily ascends and is diffused, if not impeded; but otherwise, in close quarters, it quickly cools and becomes heavier and then occupies the lower stratum. In close and warmed and artificially lighted quarters there are frequently present, besides the exhalations from the lungs and skin, sulfuretted and carburetted hydrogen—the common results of imperfect modes of warming and lighting—and ammonia gas, the result of decomposed animal matter.

The danger of the repeated passage of the same air through the lungs is cogently expressed by the following incidents: The half-civilized nabob of Calcutta, in 1756, enclosed 146 persons

in a dungeon only eighteen feet square, of less than 5.900 cubic feet, with two small windows on one side, of whom 123 died in a single night; the master of the emigrant steampship Londonderry, on her passage from Liverpool to New York, in 1848, on account of stormy weather, forced 200 steerage passengers into a steerage eighteen feet by eleven and seven feet high (thus allowing but seven feet of cubic space to each person), and closed the hatches upon them; on the removal of which, in the morning, there were seventy-two dead and several others expiring in convulsions, and with blood starting from their nostrils, ears and eyes; and by the act of a "distressed American seaman," the chief mate of the ship Waverly, of Boston, in 1858, who complained of "hard treatment" because he had been sentenced to jail four years for having confined 400 coolies below decks for *twelve hours*, during which time 270 were suffocated: these examples, to which others might be added, are cited as object-lessons worthy of continual repetition in school books.

Carbon dioxide is commonly considered non-poisonous, but only, as above described, irrespirable. But this is an error. Numerous experiments on animals have demonstrated to the contrary. R. Angus Smith found that thirty volumes per 1,000 atmospheric air caused great feebleness of the circulation with usually slowness of the heart's action and quickened respiration. These effects lessened when the amount was smaller, but they were evident when the amount of carbon dioxide was only one volume per 1,000—an amount often excelled in dwellings, particularly in bedrooms.

Symptoms of carbon dioxide poisoning are irritation of the throat, headache, giddiness, singing in the ears, drowsiness, gradual loss of muscular action of the heart, hurried respiration, syncope, nausea, and sometimes vomiting and convulsions; and, finally, as these symptoms disappear under continued exposure, coma and death. Few are the teachers in our public schools who have not observed some of these symptoms.

The Air of Subways.—While writing this article, the report comes to us that Prof. D. A. SUTHERLAND has lately made a series of analyses of the air of the London "tubes" with results that should not fail to attract the attention of the engineers of the New York Rapid Transit Commission. If they are relying in any sense upon London experience, it is evident that the results in that city should not be accepted as satisfactory for New York. The fact was established by test that the air of the street outside the tube

stations of the Central London Railway contains normally an average of 2.83 parts of carbon dioxide in 10,000. Tests made inside the stations and in cars under various conditions gave the following mean average results:

During hours of limited traffic—

	Carbonic acid in 10,000 volumes of air.
On platforms at 8.15 A. M.	4.23
On platforms (Saturday), 7 P. M.	3.74
In elevator, 10.10 A. M.	7.36
In cars, 9.30 A. M., from city	4.33
In cars, 1.30 P. M., from city	5.33
During hours of heavy traffic—	
On platforms, 4 to 7 P. M.	11.04
In cars, 9.30 A. M., to city	16.65
In cars, 4 to 5 P. M., from city	13.74
In cars, 6 to 6.45 P. M., from city	15.54
In cars, 6.10 P. M., from city	20.46

The carbonic acid tests were made between the 11th and the 15th of December. The range of outside temperature was between 37 and 56 F. The range of temperatures on the platforms was between 56 and 76 F., and in the cars between 66 and 76 F. The barometric pressure throughout the period of the experiment was very constant, ranging between 30.1 inches and 30.2 inches. Readings with the anemometer showed an air movement due to forced draught and train movement of from one mile to five miles per hour. Some of the tests were made with the Chattaway and Wharton apparatus, and some by the Pettenkofer method. One method was employed to check the other, and the mean average result was 16.62 volumes of carbon dioxide in 10,000 volumes of air.

The ventilation of a crowded car is difficult even under the most favorable circumstances. But the figures above cited have especial significance with reference to the Pennsylvania terminal and for those who will have professional responsibility for the Hudson River trolley tunnel now building.

As the result of careful observation and repeated experiments on a practical scale it has been ascertained that the air of occupied rooms vitiated by the presence of more than 0.8 per volume of

carbon dioxide (twice the average amount in the atmosphere), is dangerous to health. The danger, however, is not wholly attributable to the excess of carbon dioxide, but as much to the diminution of oxygen.

While it is impracticable to maintain the same degree of purity of the air of any occupied enclosure as that of the atmosphere, the object of all methods of ventilation is to approximate that condition as nearly as practicable.

Ammonia is a light, colorless, gaseous chemical compound, one of the products of the decomposition of nitrogenous organic matter. It consists of one equivalent of nitrogen and three equivalents of hydrogen. It exists normally in the proportions of about three and a half volumes in every 10,000,000 of atmosphere. In other words, in ten millions gallons of atmospheric air the amount of ammonia gas present is, on an average, about three and a half gallons; it frequently exceeds this, however, and wherever it does it is always suggestive of impure local conditions.

It possesses a strong pungent, familiar and offensive odor, common in the vicinity of horse stables, from the manure of which it is often evolved with dangerous significance. For all accumulations of organic matter in process of putrefaction are more or less dangerous to the neighborhood as localizing conditions of infectious diseases. The disagreeable odors emitted by organic matter in process of decomposition, ammonia gas, or other, though useful as a warning of its proximity, adds to the danger by stimulating the sensitiveness of persons exposed to it and thereby lessens the power of resistance to disease.

Ammonia is exceedingly soluble in water and hence it cannot long remain in excess in the atmosphere in regions subject to nature's great air cleansers, rain and snow, by which it is deposited on the surface of the earth. Rain water always contains ammonia in solution, and it is this which gives the apparent sensation of softness to rain water experienced in its use. Nevertheless there is always some ammonia present in the air roundabout, doubtless because organic matter of one kind or another, in process of decomposition, is also always roundabout, and of this the presence of ammonia is evidence. In an address on "Air as a Sanitary Agent," delivered at the Sanitary Institute of Great Britain by Dr. Angus Smith, the distinguished author of the celebrated work in "Air and Rain," a few years ago, occurs the following practical remarks with regard to the significance of ammonia:

"When a room is shut up even for a day, unless the room be very large indeed, there is always that peculiarity observed by sensitive persons to which would be given the name of closeness. Yet there are people who do not seem to observe this and who spend their lives in rooms in which this closeness may be constantly observed. I have often reflected on this peculiar condition. Surely if oxygen removed all impurities these impurities ought to have been removed, since the oxygen of the air is never absent from the rooms except to such a small extent that the estimation of the change is extremely difficult. If we lift up a window and allow the air to blow into the room so as to replace the original air we do not at all times attain efficient aeration. It takes but a few minutes, in a climate where there is considerable motion in the air, to renew the atmosphere of a room entirely. We may judge of this by making a trial upon a visible atmosphere, viz.: one pretty well filled with smoke. We see how rapidly, with an open window, every trace may be removed from the farthest corner, and yet this new air is not sufficient to refresh the room, and closeness is the characteristic still complained of. It is the custom in well-regulated houses not to renew merely the air, but to cause the air to blow through the house for a considerable time every day when the weather permits it. Knowing this for a long time I wondered much what was the reason. Surely, I said, there was vital air enough without the long-continued current. Looking further at this subject it occurred to me that really clean houses were preserved in this condition by something more than currents of air, generally, and that good housewives resorted to the practical methods of rubbing by hand, and it seemed clear that no furniture could be preserved from the peculiar condition of mustiness in any house where the doors and windows must be frequently closed unless the absolute removal of certain substances from the surface was resorted to. And what was this substance that required to be removed? I supposed it to be one of organic origin. If organic matter is everywhere, the presence of ammonia is everywhere possible; and if that matter is decomposing, ammonia is everywhere present; that is the general statement which this paper illustrates. It is now many years since it was observed by me that ammonia could be found on surfaces exposed to exhalations from human beings, but it is not until now that the full significance of the fact has dawned on me and the practical results that may be drawn from it in hygiene and meteorology. These results are that ammonia may be an index

of decayed matter. This does not apply to the substances which may be called germs, whether it be possible to see them or not, because they are not bodies which have passed into the ammonical stage, although some of them may be passing—those, for example, which are purely chemical and exert what we may call *idiolytic* action.

"As a part of the atmosphere ammonia touches all substances, and can be found on many; it is in reality universally on the surface of the earth in the presence of men and animals, perhaps attached more or less to all objects, but especially to all found within human habitations, and we might also add, with equal certainty, the habitations of all animals.

"This ammonia on the surface is partly the result of decomposition continually taking place, of organic matter adhering to everything in dwellings. The presence of organic matter is easily accounted for, but it is less easy to detect than ammonia. It is probable that the chief cause of the presence of ammonia on surfaces in houses and near habitations is the direct decomposition of organic matter on the spot. If so, being more readily observed than organic matter itself, it may be taken as a test, and the amount will be a measure of the impurity."

CONSUMPTION IN THE BRITISH NAVY.—Gerald Sichel says ("British Medical Journal," Oct. 4, 1902) it may be confidently assumed that in the navy, as elsewhere, the lungs are *par excellence* the favorite sites both for infection of the individual patient and for the propagation of the disease to others. Tuberculosis costs the English navy £20,000 per annum. The question of ventilation is of the first importance so far as the cure of consumption is concerned. The remedy for this disease is in prevention rather than in cure; that is, in prompt diagnosis. Careful microscopical examination probably affords the surest and earliest method of making a reliable diagnosis. On the other hand, exceptionally, the bacillus can only be demonstrated after prolonged and frequent search in cases in which physical signs point to advanced disease. Once tubercle bacilli have been demonstrated, the only proper course is to at once invalid the man out of the service. The writer concludes by emphasizing two important practical points: (1) We should consider it our earnest duty, more particularly on board ship, to carry out the needful simple examination of sputum systematically. (2) Every medical man, whenever he gets the opportunity, should urge the necessity for compulsory notification of tuberculosis throughout the country.

DIRTY SCHOOL HOUSES.

THE JANITOR AS FINANCIER.

From the "Brooklyn Eagle."

As I go on my bookish rounds from school to school I accumulate a good deal of talk about this and that. It requires some care to decide how much of this is nobody's business. Sometimes mistakes are made and offense is taken at the quality of the gossip unloaded on the readers of these Sunday morning columns. The theme I exploit now is public property. It is of vital concern to all of us, as parents of children whom we want trained to be strong and healthy men and women, above all to be safe from danger of diseases due to dirt in school rooms. From what I have read in the "Eagle" last week and from the talk I have heard from school men who have read the same matter, this treatise on janitors is composed.

The care of school buildings has long been a leading topic with the persons now in power in this city. The Municipal Civil Service Commission took it up early in 1901. At that time sworn statements were required of all the janitors to show how many helpers and cleaners each one employed and how much he paid for the service. The commission heard testimony that the school buildings were in a filthy condition, and that the system of payment for cleaning, by giving the janitor a lump sum, out of which he could pay his help, keeping the residue himself, was a perpetual encouragement to make money by neglecting work. It passed rules requiring janitors to select their helpers from a civil service list. Thereupon the Janitors' Association secured the introduction of a bill at Albany, providing that janitors' helpers should be exempted from civil service regulations. George Austin was employed as counsel to push legislation. The bill passed both houses, but was vetoed by Governor Odell. A test case on the Civil Service Commission's power was made by the Janitors' Association in the case of Janitor Doyle of Public School No. 118, Brooklyn. By order of the commission Doyle's name was stricken from the payroll because he was alleged to have employed helpers not on the civil service list. The Janitors' Association, through Doyle, secured a writ of mandamus from Justice Gaynor to re-

store Doyle to the payroll. The opinion handed down by the judges who heard the arguments on this mandamus decided that the commission could not cause the janitor's name to be erased from the payroll, but it did not pass upon the question whether or not the helpers must be selected from the civil service list. The mandamus, nevertheless, seemed to put a damper for the time on the efforts of the commission to reform the janitor trouble.

The Janitor System Dates from the Long Ago.

To reform the cleaning service is no summer's day job. The present scheme of giving to janitors the distribution of patronage is a time honored institution, dating back to the most prosperous days of the trustee system. It originated in the time when Manhattan and Brooklyn were aggregations of small villages. When a school trustee went out of office or was changed from one school to another, all the painters, carpenters, plumbers, steamfitters and various repairers knew there would be no more work for them in the old school. The new man doled out the jobs to his own following of contractors. The janitors had a good deal of the same kind of power. Douglas Stewart, in an article he wrote for one of the magazines six or seven years ago, gave instances of janitorial thrift in requiring fees from contractors, and of good cash business carried on by the "Two Js"—the janitor and the junkman—in metal tops of radiators, etc. When the reform laws abolished the district trustees and removed from ward politics the power to fill the teaching positions no sweeping changes were made in the condition of the janitor. He still receives his salary on a basis of floor and sidewalk space. He is still the judge as to how many helpers he shall employ and who they shall be. If he has one of the large schools he receives from $3,000 to $5,000 a year. This makes him an important resident of the ward. He and the political leader can exchange favors. If the janitor could find positions for men who have appealed to the prominent citizen, the prominent citizen will be glad to render service by interceding with the committee on janitors in the school board, if any trouble ever comes up. The janitor lives in the district where the school is located. The principal lives where he pleases.

The janitor is at the building during longer hours. He knows the people. He is the most important man in the institution. If the janitor of a flat is It, the school janitor is IT. This is

especially true in Manhattan. When school boys see him coming they say to one another: "Look out, here comes the owner." In Brooklyn it is becoming the custom to apply the title "Doctor" to a school master; in Manhattan they save this for the janitor. In Brooklyn it is not uncommon for visitors to inquire for the principal; in Manhattan they ask for "the other man." I remember when Public School No. 108, in Brooklyn, was opened. A great many visitors went to see it, for it was then, as now, remarkably better than the average school. Once when a party of strangers asked to see the school and was being shown through the building by the janitor the strangers said: "We want to see some class work." "Oh," said he, "you want to see Mr. Stevens; he has charge of the educational department." These visitors still tell this story with great glee, for they come from a place where the principal, like the captain of a ship, directs the whole property. But this story falls flat in this locality, for we are so accustomed to New York conditions that we see nothing unusual in the janitor's reply. A new principal often tries to get the building cared for according to his own notions, but he soon finds the local standards of service so low and the authorities so indisposed to raise them that unless he is unusually vigorous and long-winded he gives it up and protests only in the case of gross neglect. The janitorial side is too strong for him. The association, with its rules, its agreements, its committees and its influence, is stronger than most single principals in the system. At this writing the janitor of the Normal College is holding on to rooms that are in urgent demand for classes to relieve overcrowding, while the vapors from his cookery saturate the air so nearly to the dew point that an unexpected lowering of the temperature would precipitate upon the young misses a shower of onions and cabbage. Throughout the school system the feeling pervades that there is not power enough to require a janitor to do his work. Those who visit the schools say the rooms and hallways are dirty. When Dr. Joseph H. Raymond, of the Department of Health, conferred with the principals they told him the janitor service was bad and the system was rotten. They declared that it was a scandal of the schools that adults, less likely to litter up a place than children, had their public offices gone over by an army of cleaners and scrubbers every day, but that the schools where little ones are and which should be cleaned more frequently than any other kind of place, were notoriously neglected; that the method

of hiring janitors leads them to speculate on cheap help or to find employment for their children and their grandfathers, putting boys and blind old men through the motions of sweeping, who wouldn't recognize a clean room if they saw one. When Dr. Raymond inquired of what help the principals would give the Health Department or the Medical Association if either should make an investigation, they shouted: "All you want;" "More than you can use;" "Everything," and "Try us and see."

Promised Reform of Janitor Service.

No such investigation was forthcoming. The only man whose chief business it is to aim for a clean building, the janitor, has no positive and continued incentive before him for cleanliness. Railroad companies offer cash prizes for the best kept station and have the awards made by a committee of station masters which is taken to all the houses of a division. Each one is educated thereby toward the standard reached by the prize winner. The scheme which the Board of Education maintains does not give a prize to the dirtiest, most poorly kept building, but it encourages every janitor to expend just as little as possible on cleaning, for every cent that the janitor abstains from spending upon labor goes into his own pocket. Questioned by the Civil Service Commission the inspector of buildings testifies that the Board of Education exercises no power over the janitor's helpers, as to number or fitness or remuneration. In regard to all the schools mentioned he gives as his opinion that they are not properly cleaned and cannot be cleaned by the help employed. Principal Downing testifies that the janitor does not keep the building clean. His janitor is shown by his own testimony to receive more than $5,000 yearly salary, and after paying his wife and child, among other helpers, to have $3,000 profit remaining.

When the present Board of Education began work in 1902 the common talk in Fifty-ninth street was that the committee on care of buildings was going to take this bull by the horns and yoke him to a workable sweeping machine. A commission on janitor service was going to modernize the system. New rules for janitor service have figured in rumors, but the janitors, as such, have not seen them yet. An officer of the building department of the School Board has been assigned to the supervision of janitors and has already electrified some parts of the service, but the men do not

realize that it can be possible that any one can give them orders. In one of the Brooklyn schools this inspector was so unkind as to say that a floor was filthy.

"Have your man bring a pail of water and a mop," he said. "When I have finished some further inspection I'll come back and show you how this should be cleaned."

When he returned the water was not there. "Great Scott!" said the inspector, "of course your floors are dirty if your help hasn't been trained to mind you. Now, if you can't command your help, do it yourself. Get me some water at once."

The man of influence was astounded, but brought the water and received a lesson in scrubbery. This man, with hundreds of others, needs repeated shocks of this kind until the service understands that some one means business. One inspector for the four hundred janitors under the present system is like a drop of pepper in a hogshead of army soup. And the janitors say they'll "break" him if he doesn't stop his "ungentlemanly insinuations and high-handed commands."

Plans Proposed by Principals.

Principals are not unanimous in their opinions of the cleaning problem. Some think the inspectors of the building department who are now sent to the schools to report on heating apparatus, repairs needed and the nature of work done by contractors, ought to be required to report to the board the adherence of the janitor to his rules, or his departure therefrom. They say that the rules are not observed. These statutes show careful work by some legislative head. They require sweeping of every room, stair and hall between 3 o'clock and 8 o'clock the next day; dusting all the furniture, window sills and woodwork; a monthly scrubbing (not mopping) of all the floors in entries, halls, stairs and schoolrooms; a dusting of the side walls, blinds and cornices every two months, oftener if necessary; at the same intervals, oftener if necessary, a cleaning of the windows. They require the janitor to clean the sidewalk and to keep it clean; to allow no accumulation of refuse in the basement; to open the windows and thoroughly ventilate every classroom at the close of every school day, and again every morning before eight, to maintain the temperature of the rooms during sessions at 68 to 70 degrees; to run the ventilating apparatus to its full capacity; to visit every room,

water closet, passage, stairway, yard, etc., before securing the exits so as to avoid locking children in; to distribute the mail; to care for the clocks; to report in writing damage to school property; to keep an inventory of school furniture, and to observe four or five pages more of other rules laid down for him. Some principals suggest that the legislative end of the janitor service has been overdone and the executive part neglected. They intimate that if the same authorities that make the rules would attempt to oversee the janitors' observance of them the situation would be clarified. It is possible that some principals add unnecessary loads to the burdens already proposed for the guardians of the buildings. But all agree that the situation is bad and the problem urgent.

The Civil Service Commission is going over it again. It is serving summonses on principals, janitors, janitors' helpers, employes of the Building Department and members of the Board of Education. The counsel of the Janitors' Association has asked permission to cross-examine the witnesses, and is keeping things interesting. Whether the commission intends to try again to require the cleaners to be selected from an approved list and to be paid at known and regular wages by the city, it does not say. The dangers we, as parents, most fear are the dangers of dirt. It would be possible for a Civil Service Commission to increase them. Miles O'Brien and Abraham Stern told the commission that to cut down the janitors' pay would result in a refusal of janitors to serve. The delay in getting others from the list would throw the schools into chaos. School No. 33, in this borough, was without a janitor from August to January last year. The opponents of the civil service scheme claimed that the civil service rules prevented the more speedy appointment of a caretaker. The rooms became notoriously filthy and the place was finally closed and 1,500 children sent home until the matter was settled.

Various Ways of Cleaning Up.

We do not want chances of such action increased. But we do want something better than we have now. Douglas Stewart says the present system compels children to pass their time in such wretched places that it ruins their health and dwarfs their minds. He says a good part of the next generation of New Yorkers will be nearsighted, crooked and hysterical. He wants a department of window cleaning organized so that the squads may go from

school to school to let in the light. He thinks the apathy and indifference of the public to dirty school houses is terrible. A writer in the "Eagle" of last Monday wants the local school boards to take the matter up. The charter says they shall visit each building at least four times a year and inspect the same in respect to cleanliness, safety, warming, ventilation and comfort. The principals say that the service of the local boards in this respect would be a hundred times more valuable than the attempts to estimate the scholastic intricacies of the course of study. One principal suggests that the schoolmasters themselves should ask for a committee consisting of an elementary school principal from each borough, one high school principal from the greater city, one district superintendent, one associate superintendent, one member of a district board, one member of the school board, one physician or sanitary expert and one manager of a large office building. This committee should invite all interested or able persons to speak before it; this committee should investigate the janitor work in other cities, in schools and large buildings, and should devise and present to the Board of Education a report of what constitutes adequate janitor work and what constitutes a fit school from cellar to garret. The committee on buildings should then be asked to draw up rules to require such work. The principal and the local boards should be given report blanks on which they should be required to record at stated intervals the evidence of compliance or non-compliance with each rule. These reports should be sent to the Building Department and deductions from the janitor's salary made for each violation. That reverses the present system which puts a premium on neglect and discourages complaint from interested parties.

I myself have a plan different from all of these. The present scheme gives the janitor a lump sum and lets him hire his help. Why not carry this further? Syndicate the whole thing. Make a janitor trust; give me the half a million a year, as general manager, and let me hire my workmen and clean up what I can (for myself).

MILO.

[The Editor of THE SANITARIAN recognizing in "Milo" a whilom contemporary in the Brooklyn Board of Education and active co-operator in the adoption of resolutions for the appointment of a standing committee on hygiene and other sanitary measures.]

AMERICAN PUBLIC HEALTH ASSOCIATION.

THIRTIETH ANNUAL MEETING, NEW ORLEANS, LA., DECEMBER 8-12, 1902—ABSTRACT OF PROCEEDINGS.

As usual, the Bacteriological Section met the day before the sessions of the Association began. The Section met in Gibson Hall, Tulane University, Dr. F. W. Westbrook, of Minneapolis, chairman, who, in his opening address, paid tribute to the late Dr. Wyatt Johnson, of Toronto, former chairman of the Section. At its conclusion, resolutions memorializing Dr. Johnson and Major Walter Reed, of the Medical Corps of the Army, deceased members, touching upon their ennobling efforts for humanity, were adopted.

Dr. J. M. Lindsey, of Havana, was introduced to the Section and made a brief address on the progress of sanitation in Havana.

Dr. E. A. Alderman, president of Tulane University, was introduced, and gave a welcoming address. He touched upon the importance of the efforts of the Section, paying tribute to the work that had been accomplished.

The chairman responded in behalf of the Section, which then proceeded to business. Report of committee on standard methods of water analysis was submitted. Papers on: "The Colon Bacillus," by Dr. Veranus A. Moore; "Notes on Bacillus Coli and Related Forms, with Special Reference to the Neutral Red Reaction," by Stephen deM. Gage and Earle B. Phelps, of Lawrence Experimental Station, Massachusetts; "Certain Precautions Required in the Interpretation of the Colon Test of Drinking Water," by S. C. Prescott, of Boston; "Bacillus Coli in Ground Waters," by Dr. E. G. Horton; "The Practical Value of Presumptive Tests for the Presence of B. Coli in Public Water Supplies," by Geo. C. Whipple; "Experiments with the Neutral Red Test for Bacillus Coli in the Examination of Water," by Dr. Frederick S. Hollis; "Immune Serum in the Separation of B. Typhi and B. Coli," by Dr. Adolph Gehrmann.—Adjourned for lunch.

Afternoon Session.—Officers elected for the ensuing year: Chairman, Dr. H. L. Russel, Madison, Wis.; vice-Chairman, Dr. Veranus A. Moore, Ithaca, N. Y.; Secretary, G. C. Whipple, Brooklyn, N. Y.; Recorder, Dr. H. B. Pease, Albany (N. Y.)

Council; Dr. F. F. Westbrook, the retiring chairman, in place of Dr. Wyatt Johnson, deceased; all the rest of the old council, Drs. W. H. Park, New York City; M. J. Rosenau, Washington, D. C.; E. G. Horton, Columbus, O.; Angel Gaviño, Mexico, Mex., were re-elected. After which the reading of papers and discussion were proceeded with. "Laboratory Methods During the New Orleans Water Purification Experiments," by Robert Spur Weston; "A Study of the Methods Employed for Determining the Amount of Oxygen Consumed by the Impurities of Water and Sewage," by Henry C. Fuller; "The Occurrence of Tubercle Bacilli of Exalted Virulence in Human Beings," by Dr. M. P. Ravanel; "Tuberculosis in Cattle Induced by Subcutaneous Inoculation of Material Obtained from a Child," by Dr. E. A. de Schweinitz; "The Prevalence of Dysentery in New York and New Jersey," by Dr. W. H. Park; "An Investigation of the Morphology of the Diphtheroid Group," by Dr. Francis F. Denny; "Notes on General Morphology," by Dr. Hibbert W. Hill and B. R. Rickards; "An Examination of the Value of Certain Antiseptics Used for the Preservation of Antitoxic and Other Immune Serums," by Dr. Joseph McFarland; "Formaldehyde Disinfection," by Dr. Hibbert W. Hill and B. R. Rickards; "A Practical Method for Rapid and Accurate Weighing," by H. D. Williamson and Dr. E. G. Horton. There were, besides, several papers read in abstract or by title, for want of more time, on general subjects: altogether covering a wide field of scientific inquiry.

THE ASSOCIATION convened in Tulane Hall at 10 o'clock, December 9, was called to order by the President, Dr. Henry D. Holton, of Vermont, and an opening address of welcome made by the Rev. Max Heller, of New Orleans.

After the announcements of the business committees and the local committee of arrangements, the first paper read was an "Official Examination of the Water of the United States," by Marshall Leighton, Hydrographer in the U. S. Geographical Survey Service. He showed the necessity for a complete examination into the merits of the waters in the different localities, and drew the conclusion that in the hands of the United States officials the undertaking could be carried to a satisfactory conclusion.

The Secretary, in the absence of Rudolph Hering, C. E., chairman, read, in abstract, the report of the Committee on "Disposal of Refuse Materials"—summarizing the entire field of the subject.

Resolutions were adopted for action of the Association in recognition of the work done by the late Dr. Walter Reed, U. S. A., and asking Congress to take necessary action for the protection of the health of the operatives in the work contemplated on the Isthmian Canal. Dr. Heber Jones, of Memphis, Tenn., gave a short address on the modern methods of garbage cremation as practiced in Memphis. He said that, in his opinion, cremation was the only method approaching perfection in garbage disposal, and adduced figures showing that it was more economical and safer to so dispose of garbage than in any other way. The report of the committee on "Animal Diseases and Animal Food" was called for, and in the absence of Dr. Salmon, the chairman, was read by Dr. Ravanel. It comprehended the various theories advanced from different quarters in regard to the relative virulence and the relation of bovine and human bacilli. The committee agreed that both bovine and human bacilli were dangerous to human beings, and that, if possible, the former was more virulent than was the latter. The report takes direct issue with the contention of Professor Koch, of Berlin, for the non-transmissibility of bovine tubercle bacilli to man, and contends for continuous effort against communicability by tuberculous food. On the conclusion of the report, some discussion arose as to the relative degrees of accuracy in the reported experiments referred to.—Dr. Eduardo Licéaga, of Mexico, read a paper on "Proper Sanitary Measures Necessary to Prevent Tuberculosis Contagion from the Foul Air and Fittings in Railroad Cars," purporting to show that many deaths occurring in the City of Mexico, annually, were attributable to tuberculosis contracted in dirty cars. He stated that the health authorities of Mexico had presented a memorial to the companies of the railroads running through the country, designating and asking needful measures for the prevention of tuberculosis hitherto promoted by the unsanitary condition of the cars. Dr. Conn, of New Hampshire, who is well known to have devoted much attention to railroad-car sanitation, thanked Dr. Licéaga for his paper, and expressed gratification at the efforts undertaken for its promotion in Mexico.—Dr. John S. Fulton, of Maryland, read a paper on "Vital Statistics; a Plea for Actuarial Administration and Control of the Great Resources of Preventive Medicine," demonstrating the necessity and utility of complete tabulations of *all* statistics of births and deaths and conditions thereto related, in order to properly gauge the advance made by the different new

measures adopted from time to time toward perfection of statement.—Dr. Cressy L. Wilbur, of Lansing, Mich., followed with a paper, virtually on the same subject, and the need of co-operation by the registrars of vital statistics throughout the country, for the accomplishment of a common standard for forming comparative judgments on the results. He said that in many cities fictitious results were adduced by eliminating deaths occurring in hospitals and other institutions, and yet comprehending in the population all the itinerancy for the time being, insomuch that, notwithstanding the showing, he doubted whether any city in the United States reached an annual death rate of less than 17 per 1,000 of population. This conclusion of Dr. Wilbur elicited considerable discussion. A member from Buffalo, N. Y., remarked, with regard to his own city, most rigid methods were employed, while the rate there was but 14 per 1,000. Others stated, with reference to cities severally, all deaths in hospitals were included in their reports. Papers by members from Mexico next followed.—"Period in Which Every Contagious Malady Can Be Transmitted, and Period in Which Every Sick Person is Dangerous to Healthy Persons Near Him," by Dr. Louis E. Ruiz, was listened to with marked attention.—Dr. Jose P. Guyon read "A Note Concerning the Transmission of Pathogenic Fungi by Flies and Mosquitoes," technically discussing the now generally accepted belief in the transmission of certain diseases in tropical countries, especially by these means.—Dr. Jesus E. Monjaras read a paper on the "Principal Causes of Infectious Diseases and the Principal Means to Act Against Them," dwelling in particular upon the various sanitary measures in vogue in the Spanish-American countries.

Evening Session was held, beginning at 8 o'clock, to hear the Welcoming Address of Mayor CAPDEVIELLE and Hon. J. Y. SANDERS, Speaker of the Louisiana House of Representatives; and the Address of Dr. HENRY D. HOLTON, President of the Association. The session was opened with a prayer by the Rev. Father Laval, of St. Louis Cathedral, a gem in thought and wording, expressive of the great debt of gratitude owed by men for the opportunity and means to combat the afflictions of the human race, and giving thanks for the deeds already done, as well as asking blessings upon the future progress of the great work.

Mayor CAPDEVIELLE expressed great pleasure in behalf of the city at the meeting of the Association here. He said in part:

"Louisiana, from an early date in her history, has pursued the enlightening public policy of fostering the studies which are neces-

sary for the development of sanitary regulations, or those means designed to secure health, as calculated to produce the most beneficial effect on the people of the State, tending at once to the increase of population, the extension of trade and commerce, the productiveness of agriculture, and the rapid growth and progress of the arts and sciences.

"Having constantly in view the policy in question, the property holders of New Orleans have not very long since laid upon themselves the heavy burden of additional taxation, the proceeds of which have been capitalized in 4 per cent. bonds amounting to $12,000,000, having fifty years to run, in order to construct a system of drainage and a sewerage system, with free water therefor, through the city. At this interesting period in the history of the place, a considerable portion of the system of drainage has been completed. When the many obstacles are taken into account which it has been required to overcome, I am able to say that the result so far attained is satisfactory.

"We live in Louisiana in a terrestrial paradise, whose riches, science instructs us, are in all probability not yet half explored.

"The Mississippi is held in by artificial banks as it courses its way to the Gulf of Mexico. The gardens of New Orleans, luxuriant with semi-tropical plants and shrubbery, and the streets of the metropolis are no longer to be deluged by the torrential rainfalls of the locality, but, conveyed in open and in lined and covered canals, will be discharged into the Lake Pontchartrain, and, eventually, into Lake Borgne. When the alluvial plain on which the city is built will have been sewered, and the filth and other foul and polluting matter which has heretofore been deposited and left to infect the soil, will have been removed, New Orleans is certain to become as healthful a place of residence as any other large American city.

"Gentlemen of the Convention, I greet your gathering in this place with heartfelt satisfaction. Our people have watched your coming with deep interest. They will witness your departure, when that has to take place, with unfeigned regret.

"Speaking for the people, and in my own name, besides, I bid you once more a heartfelt welcome."

Mr. SANDERS spoke very briefly, but cogently, to the purpose. "It gave him pleasure to accede to the request, and in the name of the Governor, to welcome the Convention to the hospitality of the State of Louisiana, and he embraced the opportunity of speak-

ing some words which expressed his own heartfelt desires as well as those of all the great Commonwealth—that the work of the Association should ever prosper, and that in the future, as in the past, all mankind would have a debt of gratitude owing to the work of the American Public Health Association."

President HOLTON thanked the preceding speakers for their cordial welcome to the Association, and proceeded to deliver the annual presidential address. He sketched briefly the progress that had been made in preventive medicine throughout the country since the organization of the Association; dwelt upon the achievement of practical sanitation in Cuba, and awarded high tribute to the work of Drs. Jesse W. Lazear and James Carroll, who sacrificed their lives in the performance of dangerous duty for the cause of sanitary science. He also paid tribute to deceased members of the Association during the year: Robert C. Kedzie and Albert L. Gihon, ex-presidents; Thomas J. Turner, Medical Director, U. S. Navy; Col. John F. Kimball and Major Walter Reed, U. S. Army, and Prof. Wyatt Johnson. He then proceeded on the objects and hopes of the Association with regard to preventive medicine; reviewed the progress made in the prevention of tuberculosis and other diseases during recent years, and referred to the pending conflict with small-pox. He next referred to the enlarged scope of the Marine Hospital Service, and discussed the comparative merits of the two bills before Congress, concluding with an argument for the establishment of a thorough public health service, which should have complete control of all matters pertaining to sanitary regulations, quarantines, and the like measures for public safety.

The Second Day.—Following the routine of announcements, Dr. Probst, the Secretary, submitted a resolution agreed upon by the Executive Committee, which was later adopted, incorporating Cuba into membership with the American Public Health Association, and asking the President of the Republic to appoint representatives to the next convention. Another resolution submitted and subsequently adopted instructing the Executive Committee to do all in its power to secure uniform registration of deaths in all the countries conjoined in the Association. A memorial resolution on the death of Dr. Robert Clark Kedzie, of Michigan, was offered by Dr. Henry A. Haigh, of the same State, and referred.

Dr. U. O. B. Wingate, of Wisconsin, Chairman of the "Committee on Legislation," reported in detail the action of the com-

mittee in its prolonged effort to obtain a National Department of Public Health, and the final result in a compromise creating the "Public Health and Marine Hospital Service of the United States" (as per act of Congress, SANITARIAN, Vol. xlix, p. 116), of which he gave an analysis. In the discussion which followed, Surgeon-General Wyman said that the report of Dr. Wingate was, to him, a subject of much gratification.—Dr. F. S. Munoz, Mexico, presented a paper on "The Cause and Prevention of Infant Mortality."—Dr. R. N. Prado one on "Wet Nurses and Their Hygienic Importance." These papers were read by interpreters and attracted close attention. That of Dr. Prado, in particular, brought out the ideal for motherhood—that each mother should nurse her own child—but called attention to and described the conditions when she should not, when it became the duty of the physician to define and decide upon the quality of the wet nurse, constitutionally as well as hygienically.—"Disinfectants and Disinfection" was the next topic, the report of a special committee, Prof. Francis Robinson, of Brunswick, Me., chairman, but he being absent, the report was read by Dr. Hibbert Hill. It, for the most part, consisted in a summary of conclusions on the proper use and relative efficacy of formaldehyde gas and carbolic acid, as several times reported upon heretofore by the same committee. Dwelling upon the special advantages of formaldehyde for closed areas and how it can be most effectually used. In the discussion which the report elicited, William Fawcett Smith, of the Army of Mexico, mentioned a "rough and ready" method of disinfection occasionally used, when the means were not available. In Porto Rico, upon the occurrence of glanders among the stock, the walls and floors of a large stable were cleansed by "flashing" with kerosene. The method was efficacious and did no harm to the building or fittings. Dr. J. J. Kinyoun gave the results of some experiments he had made in regard to the uncleanliness of railroad cars, which showed these vehicles to be less dangerous than they were sometimes thought to be. The drinking cup, he considered, was the most likely source of nearly all the contagion to which railroad cars are liable.—"National Lepers' Home," by Dr. S. H. Durgin, of Boston, was the next paper. He stated, in substance, that, contrary to general belief, there were no American-born lepers in the Northwestern States, where the population is made up largely of Scandinavians and their descendants, this belief cannot be maintained, "for I now have knowledge of three young men,

American born, who have contracted leprosy in Minnesota. There is but one institution in the United States known as a home for lepers, and it is in Louisiana." After giving a sketch of the provisions in Canada, Mexico and Cuba, beginning with the early settlements of those countries by Europeans, the recent effort of the Marine Hospital Service to obtain a census of the lepers in this country, and its recommendation that "sites covering broad areas be selected, in healthful localities, where lepers can have unlimited outdoor exercise and occupation. That these homes should be made attractive and comfortable, so that the unfortunate victims of this disease, instead of hiding their condition, may make it known and request admission to these public institutions." And added: "With our present knowledge of leprosy in the countries which we represent, and the methods employed in its care, it seems to your committee advisable that the resolution adopted by this Association at the Indianapolis meeting, 1900, be reaffirmed; and that the work of pushing legislative action bearing upon this action be referred to our legislative committee."—The resolution referred to pledged the Association to do all in its power to secure the establishment of a national home for lepers.

The afternoon was devoted to an excursion on the river.

Third Day.—The morning session began with miscellaneous business and action upon pending resolutions.—Dr. C. P. Wilkinson, on behalf of the Local Committee of Arrangements, presented to President Holton a gavel made of the wood of a Louisiana orange tree and bound with an inscribed silver band.—Two reports of committees that had been deferred at the previous day's session—"Dangers to Public Health from Illuminating Gas," Dr. S. H. Durgin, chairman; and "The Transportation of Diseased Tissue by Mail," Dr. F. F. Westbrook, chairman—were read. Next followed papers: "Tuberculosis and Agricultural Colonies," by Dr. Felix Formento, of New Orleans; "The Relative Immunizing Value of Human and Bovine Vaccine," being the report of a committee, Dr. P. H. Bryce, of Toronto, Can., chairman; "Only Asepsis Necessary in Vaccination," by Dr. Jesu Gonzalez Urena, of Mexico; "Human Vaccine as a Preventive of Small-pox," by Dr. E. Licéaga, of Mexico; "Experiments in Revaccination in Mexico," by Dr. Jose Ramirez, of Mexico.—Secretary Probst reported favorable action by the Executive Committee on the resolution looking to the establishment of a national sanatorium for consumptives, adopted. The resolution asking for the abolition of quarantine in virtue of

recent knowledge on the transmissibility of yellow fever, was reported adversely by the Executive Committee; the report was accepted by a very close vote. It was vehemently opposed by most of those who unqualifiedly accept the mosquito transmissibility exclusively. But Dr. Guiteras, who so believes, nevertheless advocated, and was chiefly instrumental in, the adoption of the Executive Committee's report.—A memorial resolution of the late Dr. H. B. Horlbeck, ex-president, was adopted.—Motion was made that the president appoint delegates to the American Congress on Tuberculosis, to meet in St. Louis, 1904: adopted.

Committees for 1903 were announced as follows:

Purification of Public Water Supplies—G. W. Fuller, New York City, chairman.

Disposal of Industrial Wastes—Dr. G. T. Swarts, Providence, R. I., chairman.

Purification and Disposal of Sewage—George H. Benzenburg, chairman.

Disposal of Garbage—Rudolph Herring, New York City, chairman.

Animal Diseases and Food—D. E. Salmon, Washington, D. C., chairman.

Car Sanitation—Dr. G. P. Conn, Concord, N. H., chairman.

Steamboats and Steamships—Dr. Peter H. Bryce, Toronto, Can., chairman.

Etiology of Yellow Fever—Dr. John W. Ross, U. S. Navy, chairman.

Plague—Dr. Alvah H. Doty, New York City, chairman.

Demography and Statistics: Their Sanitary Relation—Dr. Wm. A. King, Washington, D. C., chairman.

Cause and Prevention of Infectious Diseases—Dr. A. R. Reynolds, Chicago, Ill., chairman.

Disinfectants and Disinfection—Dr. Hibbert Hill, Boston, Mass., chairman.

Production and Free Distribution of Vaccine—Dr. H. P. Walcutt, Cambridge, Mass., chairman.

The Teaching of Hygiene and Granting Diplomas of Public Health—Dr. Benjamin Lee, Philadelphia, Pa., chairman.

Standing Aid Societies—Dr. Geo. W. Goler, Rochester, N. Y., chairman.

Publication—Dr. Josiah Hartzell, Canton, chairman.

Dr. Fred J. Mayer, of Scott, La., offered a resolution regarding Sanitary Education, that the Association promulgate a campaign

of education to enable persons of all classes of society to combat with sanitary measures the incipiency of all infectious diseases: referred to Executive Committee.

At the afternoon session the subjects of discussion were: Committee report, Dr. Chas. A. Lindsley, of New Haven, Conn., on "The Canteen System of the U. S. Army"; "Sanitary Aid Societies," committee report, Henry Lomb, Rochester, N. Y., chairman; "Dirt Diseases and the Public Health," by Dr. C. V. Chapin, Providence, R. I.; "Oculists and Opticians," by Dr. Augustin Chacon, of Mexico; "The Water Supply of New Orleans and Its Improvement," by Robert Spur Weston, of Boston, Mass.; "The Ways in Which Typhoid Fever May be Transmitted," by Dr. Wm. T. Sedgwick, of Boston, Mass. Discussion on these papers was mostly upon channels of infection in contagious diseases and the prime importance of pure water, centering chiefly on typhoid fever. Dr. Sedgwick arranged his evidence as follows: 1. The water supply in a number of American cities has been made approximately good. 2. In cities having a pure water supply and yet suffering from typhoid fever, the prevalence of the fever follows closely the warm weather. 3. Many cities, in spite of the purity of their pure water supply, still pay a heavy tax in typhoid fever. The conclusion he deduced from this evidence was that the fever was contracted through the presence of undisinfected excreta of patients. Dr. Woodward, of Washington, said that he believed that the fact that typhoid fever is most malignant during warm weather does not prove conclusively that the infection is conveyed through typhoid excreta. If there is any chance for contraction of the disease by water, it is in the summer, when many of the streams, especially brooks and creeks from which water is used, are low and clear. In the floods of the spring and winter the disease and other germs that are swept into the water have not the chance of concentration that is possible during a season when the water is more or less at a standstill. Much typhoid might be contracted from the use of such water, which is liable to be overlooked as a source of infection. He forced the proposition that the water is often more dangerous when it is pleasant and appears most attractive. Dr. McGehee thought that while the conclusion that undisinfected excreta was a principal source of typhoid fever infection may be correct, nevertheless there were many other ways by which the typhoid germs could be transferred to water from such excreta as had not been disinfected. He

thought it the part of wisdom to preclude the use of water at hotels and other public places unless it was first boiled.

The canteen question came in for part of the discussion. But the report of the committee was confessedly inadequate; the only member of the committee who had access to the records in Washington was not present, hence, the chairman said, "to make any additional report over the last was impracticable. But he might say the committee had taken a different stand from those persons who seem unable to make any distinction between total abstinence and temperance. The general attitude of the committee was in accordance with Scriptural injunction, 'Be temperate in all things.'"—On motion, the committee was continued.—Dr. Hurty, of Indianapolis, who read the report of the Committee on Sanitary Aid, said that lectures had been delivered before schools and churches, to school children, their mothers and other persons. Frequent application had been made for such lectures. In fact, forty-seven had been delivered in one season. A variety of phases of principal topics had been treated, including directions for hygienic measures during small-pox and other diseases. The lectures were given with lantern slides preferably. Another feature had been the distribution of publications of the boards of health in different places. There had also been inspections of houses in infected districts, and efforts made to stop the spread of consumption and other diseases. Trained nurses had been furnished in various instances, co-operation of effort effected and urged, so that, all in all, information had been disseminated in many ways. Discussing the paper on "Dirt Diseases," the author said that to fight infection the important thing is to get at its source—to prevent its spread from the infected person to healthy persons. Dr. Kohnke, of New Orleans, said that while he appreciated the paper on "Dirt Diseases" in its pointed features, it was well to remember that cleanliness should be enforced every way. If all cleanliness were made a point, then the dangerous kinds of uncleanliness would be sure to be covered by steps to procure municipal cleanliness, which was, in a degree, correlative with personal cleanliness.—The special and important part of the paper on "Oculists and Opticians" was the common incompetency of the latter and the need of physiological knowledge as well as of pathological conditions. Prescribing by them should be wholly prohibited. Oculists should have thorough clinical training, and upon them should devolve the responsibility of prescribing.

The paper on "The Water Supply of New Orleans and Its Improvement" was both particular and comprehensive of the peculiarities of the locality with relation to the river and other circumstances and external conditions, rainfall and sources of impurity; the past with regard to cisterns and wells; the present undertaking for the supply and systems of purification, with the conclusion "that the present water supply of New Orleans is neither satisfactory nor abundant, and that sufficient data have been collected during the investigation to allow a system of water purification to be designed which will efficiently and economically purify the Mississippi River at New Orleans. Furthermore, the available evidence shows that the American system of purification is best adapted to local conditions, on account of its low first cost, coupled with adequate efficiency."

Fourth and last day's session was almost wholly devoted to the routine of winding up business and the election of officers for the ensuing year. An animated discussion arose in regard to bubonic plague in San Francisco, but without any practical remedy. Resolutions were adopted favoring a sanitary exhibit at the exposition to take place in St. Louis in 1904; asking that control of illuminating gas be placed in the hands of municipal authorities; asking that railroad and steamship companies be compelled to furnish pure drinking water, and several memorial resolutions.

Officers elected for 1903 were as follows:

President—Walter Wyman, Surgeon-General of the United States Public Health and Marine Hospital Service, Washington, D. C.

First Vice-President—Dr. C. P. Wilkinson, of New Orleans.

Second Vice-President—Dr. John L. Leal, of Paterson, N. J.

Treasurer—Dr. W. F. Wright, of New Haven, Conn.

Secretary—Dr. C. O. Probst, of Columbus, Ohio.

To Fill Vacancies on Executive Committee—Dr. John S. Fulton, of Baltimore, Md.; Dr. John A. Amyot, of Toronto, Can.; Dr. Jose Ramirez, of Mexico.

Place of Meeting in 1903—Washington, D. C.

DISINFECTION OF THE URINE IN TYPHOID FEVER.

If a physician were to neglect disinfection by some simple, recognized method of the stools in typhoid fever, he would be held blamable, and justly so. If he were to omit cautioning the con-

sumptive in regard to the dangerously infectious character of the sputum, he would be regarded as careless and negligent. Again, if the physician were to permit his scarlet fever patients to run about in the neighborhood before desquamation is completed, it would spread consternation through the community and the general condemnation of such action would not be slow in making itself effectively heard.

Numerous other instances could be mentioned of equally glaring sins of omission and commission in the preventive treatment of infectious diseases against which the general professional conscience would protest. How is it in the case of the urine in typhoid fever? It is demonstrated beyond doubt that in a considerable percentage of the patients suffering with typhoid fever, typhoid bacilli occur in that urine in large quantities, frequently so numerously that the urine is rendered turbid on that account alone. It is furthermore known that typhoid bacilli may persist in the urine for months and even years after an attack of typhoid fever, such persons being in reality perambulating disseminators of bacilli, which are deposited wherever urine falls. In this way, unless precautions are taken, the cause of typhoid fever may be perpetuated locally and new foci of disease started as the bacillophorous urine finds its way into the sources of water supply. With the springing up of brisk endemics of typhoid here and there the question arises, are physicians using proper precautions in regard to the urine of their typhoid patients? Has the proper care of the urine become a matter of definite routine as is the case with the stools? Probably much more ought to be done than is being done. Certainly a convalescent typhoid patient should not be allowed to leave the hospital or be discharged from supervision before the condition of the urine as to the absence or presence of typhoid bacilli has been established. This would require a bacteriological examination of the urine, at least in many cases, and this the vast majority of private practitioners are unable to do as thoroughly as modern sanitary ideas require. In the case of hospitals, however, such examination ought to be a matter of routine. We are in need of further reports concerning the presence and persistence of typhoid bacilli in urine after attacks of typhoid fever. Careful observations should be made with the view to the establishment of easily practicable methods by means of which the practitioner can determine for himself the condition of the urine of his typhoid patients. In the meantime, it is our

plain duty to do all in our power to prevent the spread of typhoid fever by the urine. Much may be done by the systematic use of reliable urinary disinfectants, such as urotropin, which should be administered for a reasonable time to every typhoid convalescent. Patients should be informed of the fact that their urine may be dangerous. No doubt some of them would feel the responsibility thus placed on them and exercise a certain degree of care.

This is another striking example of the direct and real value of bacteriological laboratory methods applied to practical medicine. As the matter now stands it is quite clear that practitioners of medicine, in order to do their full duty in this matter of typhoid fever, must possess or control sufficient bacteriologic skill and apparatus to determine whether or not the urine of their typhoid patients is free from typhoid bacilli before returning to their usual modes of life.—"Journal American Medical Association."

MEDICAL EXCERPT.

By T. P. CORBALLY, A. M., M. D.,

THE DANGERS OF POPULAR SPORT.

The serious and sometimes fatal accidents that occur in popular games are eminently suggestive of greater care by enthusiasts who thus expose themselves to dangerous or fatal injuries.

Lawn-tennis is not a very dangerous game, but accidents do occur more frequently, perhaps, as played in Europe than in this country.

These accidents have never been described until very recently; they have been brought to the attention of the medical profession by Dr. Clado, whose history has been published *in extenso* in "Le Progrès Médical," of November 1, 1902, in its "Clinique Chirurgicale."

Tennis-arm.—The players of *lawn-tennis* have given this name to an injury of the arm which occurs under two different forms; the first as a fatigue, an exhaustion of the muscles of the arm; the second as a material lesion, located in the neighborhood of the elbow of the right arm. The first form is found in players who force the muscles of the arm and shoulder excessively; the second is found more rarely and in conditions extremely well defined.

Through the kindness of one of the ablest players in France, the

doctor says: "I have been able to collect twelve cases that have enabled me to describe this form of disease."

The affection is characterized by a sudden pain, located at the external part of the elbow, and above the line of articulation, producing a functional loss of power of the superior part of the right arm, at least for all movements that require a certain amount of muscular strength.

The etiological conditions that give rise to tennis-arm may be easily determined. It is the result of quick and violent movements, causing functional loss of power at the same time or as some extraordinary effort is made in order to gain a definite point. In either of these efforts the violence of the muscular contraction appears to be the immediate cause of the injury.

Players having well-developed muscles are more disposed to an attack of this kind than those of more feeble development. Another important fact to be noted is that strong and well-trained players are more susceptible to an attack than poor players or beginners. Besides, female players are entirely exempt, at least I do not know of a single case. The etiology of tennis-arm may be stated in a few words; it is confined almost exclusively to men, at least I do not know of a single female player who has suffered from it. It always attacks the strong and practiced players, and begins with a violent contraction of the arm.

Three symptoms mark the existence of tennis-arm: First, pain; second, want of power in the arm; third, swelling. The first two of these are always present; the third not very frequently. Pain is the invariable and characteristic symptom of the disease. It comes on suddenly and in consequence of a violent movement of the muscles of the arm. It is characterized by a sensation as of a sudden rupture, which the player compares with that of a violent tearing at the external part of the elbow. The arm falls as if paralyzed. The injury is found to be located along the external lateral ligament of the elbow, not far from the insertion of the supinator brevis muscle.

Swelling is not constant; I have found it in ten cases, present in four; it disappears in from three to eight days. Functional loss of power is a constant symptom. In about half the cases the arm falls as if paralyzed.

The Diagnosis of tennis-arm rests on the presence of three indications. The first indication that offers—and it forms the diagnosis in the greater number of the players who have suffered—

is an almost complete loss of power of the muscles of the forearm. The duration of the paralysis varies from two to eight days, and at the end the player may generally resume his practice. In four cases, however, it lasted six months, and in one case a year. In general, active play should not be resumed before the lapse of some months.

Pathogenic Conditions.—There are two ways of returning the ball to the adversary; first, in meeting the ball from above, *raquette haute;* second, in meeting it from below, *raquette basse.* The first never causes tennis-arm. This method constitutes a bad or indifferent player. Ladies employ it almost exclusively. The hand holding the raquette is raised as high as the head, the raquette inclined backwards strikes the ball and returns it in a curved line; the muscular effort is moderate, the only strain is on the shoulder. In the second the raquette receives the ball in its course or after it has rebounded, striking it from under and returning it with great violence immediately above the filet, giving it a course as direct as possible, intending that on the side of the opponent it does not rebound from the ground.

(The movements necessary for the skillful returning of the ball are described in detail; they are quite complicated.)

Its Course depends on the prudence of the player; if he stops play immediately and takes necessary rest, recovery may be complete within a month. Relapses are frequent.

Prognosis is generally favorable. As all movements are possible, except that which caused the injury, the only permanent result is the necessity of abandoning lawn-tennis.

Treatment consists in necessary rest; massage, occasionally the application of a bandage from the wrist to the elbow. None of the severer applications used in surgery are necessary.

Football.—A Kentucky clergyman declares that football is worse than prize-fighting, because more men have been killed on the football field in this single season than have died as a result of injuries received in the prize-ring in all the years since such fighting began in this country. Another clergyman, out in Chicago, says that the spectators who thrill with joyful excitement as they watch the gridiron battles are little less bloodthirsty than the wicked Romans who crowded the gladiatorial shows, and with their cruel thumbs signaled death for the vanquished. That football has come to be a disquietingly strenuous game is beyond ques-

tion, and yet these criticisms of it are obviously absurd, for they ignore the very essential element of motive. The injury of the players is not an object, but an incident of football. Railroads are not condemned because they have in the past exacted a dreadful tribute of human lives, and even with the better methods of to-day continue to claim in every twenty-four hours more victims than fell in many a world-famous battle. Our subway, too, has already resulted in not a few deaths, and, though we mourn them, the work goes steadily on, with no protests from Louisville or Chicago. As for the spectators at football, not one in a hundred ever saw a player killed or even seriously injured, and not one in a thousand is ever likely to do so. A vast majority of the hurts received are trivial, and the onlookers are hardly to be blamed if they suffer from them as little as do the boys upon whom they are inflicted. The question whether the game as played is a profitable one is certainly debatable, but it ought to be debated reasonably, and the fact that it is commended by multitudes of people whom it is grotesque to describe as bloodthirsty should have its effect on the judgment of those whom its casualties disturb, particularly when they are clergymen whose only knowledge of the sport is derived from the reading of statistics, collected from all over the country, of deaths and injuries from it. There are no balancing figures to show the other side—its development of strength, courage and character.

EQUABLE DISTRIBUTION OF DIPHTHERIA.—Passaic's Board of Health, while searching for the origin of many cases of diphtheria that exist among the school children of the town, has discovered that the spread of the disease has been due, in large part, at least, to an invention of—the Board of Education. It seems that it is the custom in the Passaic public schools to give each pupil a lead pencil every morning, and to collect the pencils every night for another distribution next day! This plan has the obvious advantage of being economical, and it is also extremely fair. Using pencils as children always do, with frequent applications of the point to their tongues, each pupil in each school had an equal opportunity to acquire such contagious maladies as might be going around, and an equitable distribution of diphtheria was rendered almost certain. The Passaic health authorities have decided, however, that this method of supplying pencils is not, on the whole, to be commended, and they have, with some vehemence, directed

the school people to think up another scheme. It would be interesting to know in how many other towns the same and similar exhibitions of official ignorance are in progress, and especially if there is anything like it in New York. It is rumored that not quite all of our devices for supplying our public school children with text books and the other implements of their work are beyond the criticism of sanitarians, and, with such a Health Board as we now have, these rumors ought to be quickly ended, either by authoritative denial or by the removal of the abuses underlying them.

TREATMENT OF DIPHTHERIA.—Dr. J. W. Pearce ("American Practitioner and News," July 15, 1902) says that he has never lost a case, and attributes his success to the use of ecthol. "If I can get perfectly fresh antitoxine I give it, but if it cannot be had perfectly fresh I do not. Whether antitoxine is given or not, I give ecthol in full doses, appropriate for the age of the patient, every three hours, administered by the mouth. The entire fauces, larynx and pharynx are sprayed with a mixture of ecthol and peroxide of hydrogen, three parts of the former to one of the latter, every fifteen to thirty minutes. Calomel in small doses is administered every hour until the bowels are thoroughly moved. Nourishing and supportive diet is given at short, regular intervals, and everything done to make the patient comfortable in the way of supplying fresh air, etc. I have been using this plan, modifying it to suit the needs of each individual case, for several years, knowing that it will give good results and entire satisfaction if it is carefully and effectively administered and carried out. Nothing can save a patient in articulo mortis, and it is needless to try this in such cases, hoping to do something."

A MAN'S NOSE BURSTS INTO FLAMES.—A man was walking along the Boulevard Saint-Michel, Paris, one day recently, and stopped to light a cigarette. Suddenly his nose burst into flames, which spread to his beard. A crowd assembled, while the unfortunate man danced with pain until a policeman took him to a pharmacist's shop, where his burns were treated. An examination of the nose showed that it was made of celluloid, the unscrupulous dealer who sold it having foisted it on his client instead of the horn nose, which had been prescribed.

THE DISEASE-BEARING INSECTS IN RURAL HYGIENE.

By HARVEY B. BASHORE, M. D.

The study of disease-bearing insects is of special interest to the rural sanitarian, for both of these insect families flourish more in the country than in the city; one of them, the malarial-bearing mosquito, is pre-eminently a rural dweller.

The well-drained city house, situated on an elevated avenue, with its covered garbage can, quick disposal of its contents and properly screened kitchen, suffers very little from either of these pests. On the other hand, the village and country house very often swarm with both; the uncovered manure pile and decaying garbage teem with flies; the country rain-barrel and neglected drainage furnish breeding places for myriads of mosquitoes.

One great point about the life history of the fly and mosquito is that they are "born and bred," more or less, on the premises where they are found. Each householder is responsible to a certain degree for his own flies and mosquitoes. It would be well worth while to use every endeavor to eliminate these pests if for that alone, but as they are now known to carry disease, the subject becomes of vital interest to all.

Of all the sanitary appliances used in the country the earth-closet is of especial interest on account of the likelihood of being a breeding place for flies. Last year I raised some flies from the larva of an earth-closet and found that there were two principal varieties, namely, the sarcophaga, and a stable fly; both or either of these may carry disease for they are known to frequent kitchens. Earth-closets should therefore have tightly fitting covers, and if so arranged the breeding of flies in them will be reduced to a minimum, as I found by actual experiment.

The garbage hole in the garden bed, which I have frequently recommended as a method of disposal, unless covered with earth very carefully and very frequently is likely to become a breeding place; to avoid this I tried screening the hole, but found that the little fruit flies, which are particularly fond of garbage and fruit, actually crawled through the meshes of the screen, so I resorted to a tight board cover and flies were eliminated from that place at least.

The village manure pile which we used to think ought to be exposed to the sun to favor nitrification, should be covered or screened, for many of the manure-loving flies frequent houses.

The village rain-barrel is without doubt one of the great breeding places for mosquitoes, except the malarial-bearing anopheles, which, I am sure, must wander some distance from its birthplace.

The locality where I made investigation last year had all three of the anopheles family, yet I could find no possible breeding place within at least several hundred yards.

In a very wild and beautiful valley not far from my home I found larva of anopheles in the little rock pools, and by keeping them in bottles reared the adult—*A. punctipennis.*

In another instance I found them in many pools in the bed of a new railroad cutting; this would perhaps explain why railroad grading is so frequently coincident with malaria.

The country privy and cesspool is also a great breeding place of culex, and all such places should be treated with kerosene during the mosquito season.

I tried this plan, with screening of cistern, etc., in a village house, and found that there was a great diminution of the insects.

The value of small fish—goldfish and sunfish—in keeping ponds free of mosquitoes is very great. I put some catfish in a bucket containing mosquito larva and all larva had disappeared twenty-four hours after the introduction of the fish. The fact that catfish will destroy larva is interesting, because some ponds and pools are so muddy and filthy that goldfish and sunfish will not thrive; in such, catfish would seem to be the remedy.

THE PROPHYLACTIC TREATMENT OF TYPHOID FEVER.

We have read with very great interest in the "British Medical Journal" of September 27, 1902, a most valuable paper by Major Firth and Major Horrocks, of the British army, upon the influence of soil, fabrics and flies in the dissemination of enteric infection. The object of their research is well described in the title of their paper, and the experiments themselves seem to have been carried out with the greatest possible care, all collateral influences being carefully considered. Altogether thirty-six experiments were performed, and the conclusions which they reached may be summed

up as follows. We use their own words to express the results which they have obtained:

"From our experiments we draw the following conclusions, which are equally applicable to enteric bacilli recently isolated from enteric stools, as to old cultures of the organism which have been in the laboratory for many months.

"1. That there is no evidence to show that the enteric bacillus, when placed in soil, displays any disposition or ability to either increase in numbers or grow upward, downward, or laterally.

"2. That the enteric bacillus can be washed through at least eighteen inches of soil by means of water, even when the soil is closely packed down and no fissures or cracks allowed to exist.

"3. That the enteric bacillus is able to assume a vegetative existence in ordinary and sewage polluted soil and survive therein for varying periods, amounting in some cases to as much as seventy-four days.

"4. That the presence or absence of organic nutritive material in the soil appears to be a largely negligible factor, since the enteric bacillus can survive in a soil indifferently well whether it be an organically polluted soil or a virgin soil, and whether it receive dilute sewage or merely rain-water.

"5. That an excess or great deficiency of moisture in soils appears to be the dominant factor affecting the chances of survival of the enteric bacillus in, or at least the possibility of recovering it from, soil.

"6. That from fine sand allowed to become dry, the enteric bacillus can be recovered on the twenty-fifth day after inoculation.

"7. That from fine sand kept moist with either rain or dilute sewage, the enteric bacillus cannot be recovered later than the twelfth day after fouling; this inability to recover the organism is due probably not so much to its death as to its being washed down into the deeper sand layers by liquids added.

"8. That in peat the enteric bacillus appears to rapidly die out, as the microbe cannot be recovered from it after the thirteenth day; but this soil is so porous that it is quite possible that the microörganism was washed down into the deeper parts and consequently not recoverable from the place of inoculation.

"9. That from ordinary soil kept damp by occasional additions of rain-water the enteric bacillus can be recovered up to and on the sixty-seventh day.

"10. That from a similar soil kept damp by occasional additions

of dilute raw sewage, the enteric bacillus is recoverable up to the fifty-third day.

"11. That from a similar soil kept damp by occasional additions of dilute sterile sewage, the enteric bacillus is recoverable up to the seventy-fourth day.

"12. That in similar soil, after heavy rainfalls, the enteric bacillus at once disappears from the surface layers.

"13. That from a similar soil, allowed after inoculation to become so dry as to be readily blown about as dust, the enteric bacillus can be recovered up to and on the twenty-fifth day; and that enteric infective material can be readily translated from dried soil and sand by means of winds and air currents.

"14. That in a sewage-polluted soil recovered from beneath a broken drain, the enteric bacillus is able to survive up to the sixty-fifth day.

"15. That from a piece of khaki drill, inoculated with an emulsion of the enteric bacillus and then allowed to become quite dry, the microörganism is recoverable up to and on the seventy-fourth day.

"16. That from a piece of khaki serge, similarly treated, the enteric bacillus is recoverable up to and on the eighty-seventh day.

"17. That from a piece of blue serge, similarly treated, the enteric bacillus is recoverable on the seventy-eighth day.

"18. That from a piece of khaki drill fouled by liquid enteric feces and then allowed to dry, the microörganism is recoverable on the seventeenth day.

"19. That from similar fabric fouled by solid or semi-solid enteric feces and then allowed to dry, the microörganism is recoverable up to the ninth day.

"20. That the enteric bacillus is able to survive in surface soil an exposure of 122 hours of direct sunshine, extending over a period of twenty-one consecutive days. That from a piece of infected serge the enteric bacillus is recoverable after the fabric has been exposed to fifty hours of direct sunshine spread over a period of ten days.

"21. That ordinary house flies (*Musca domestica*) can convey enteric infective matter from specific excreta or other polluted material to objects on which they may walk, rest, or feed. That such infective matter appears to be attached not only to their heads (mandibles probably), but also to their legs, wings and bodies. It has not been proved that the enteric bacillus passes through the digestive tract of the fly."

All these conclusions possess a prophylactic value difficult to estimate, since they add much to our conception of the means by which typhoid infection is spread, and emphasize the necessity of seeing to it that all excreta of the patient are destroyed as soon as they escape from the bladder or bowel. Too frequently this immediate disinfection is not carried out, and physicians and nurses grow careless of the needs of a germicide used at the earliest possible moment.—"Therapeutic Gazette," Nov., 1902.

OPEN LETTERS ON VIVISECTION.

HON. JACOB H. GALLINGER, Chairman of the Senate Committee on the District of Columbia, Washington, D. C.

MY DEAR SIR: As you have repeatedly introduced bills into the Senate for the purpose nominally of regulating experiments upon animals in the District of Columbia, which bills, however, if they had become laws, would, in fact, have prohibited many, if not all of them, I deem it my duty to call your attention to the case of Midshipman Aikin of the United States Naval Academy, who was recently injured in a football game. My reason for doing so is to show you by a single concrete example that knowledge gained by animal experimentation is an immense boon to humanity and that, therefore, such experiments should be heartily encouraged.

The facts of Mr. Aikin's case are as follows: When I first saw him, three days after the accident, I found that he had been unconscious for a half hour after the accident and ever since then had complained bitterly of headache, which he located always in the forehead. Mentally he was very dull, though not comatose. His pulse was slowed down to 52 instead of being 72, the normal. Soon after the accident he began to develop convulsions, first in the right leg, afterward in the right arm also, the right arm being finally the chief seat of the convulsions. When they were very severe they involved the left side also. The face was never involved. In six and one-half hours after I first saw him he had twenty-four of these attacks, all limited to the right arm. They were not attended by any loss of consciousness. They exhausted him very greatly, especially when they were excessively severe. Several times it was necessary to give him chloroform.

There was no fracture of the skull. The only physical evidence of any injury was a very slight bruise at the outer end of the left eyebrow.

Had I seen this case before 1885, I would have been unable to explain why the spasms were chiefly manifested in the right arm, and from the evidence of the slow pulse, the headache, the stupor, the bruise in the left temple, etc., I would have been justified in inferring that probably the front part of the brain was injured at the site of the bruise. Had I opened his skull at that point, I would have found a perfectly normal brain and have missed the clot. The young man, therefore, would have died whether his skull had been opened or not.

In 1902, observe the difference. As a result of the knowledge derived from experiments upon animals which have located precisely the centre for motion of the right arm on the left side of the brain near the top and a little in front of a vertical line drawn through the ear, and disregarding entirely the site of the headache and the bruise, I reached the conclusion that there had been a rupture of a blood vessel within the head, which had poured out a quantity of blood, and that the situation of the clot should correspond to the "arm centre." The location of this arm centre was far away (about three inches) from the location of the bruise, and its position was fixed absolutely as a result of experiments upon animals, confirmed later by many operations on human beings and also by postmortems.

As soon as the skull was opened at this point the clot was found, its thickest point being exactly over the arm centre, and nine tablespoonfuls of blood were removed, with the result that the patient's life has been spared. The blood had first been poured out over the "leg centre," which is located a little higher up than that for the arm. This explained the early spasms in the right leg. The clot did not extend, however, further down than the arm centre. This explained why the face was never convulsed, for the "face centre" lies just below that for the arm.

I think if you were to ask the parents of this young man how many animals they would be willing to have sacrificed in order that their son might have his life saved, there would be no doubt of the answer. Indeed, had it been your own son, I cannot doubt the answer. But this is only one of hundreds of cases in which a similar exact localization has been made by many surgeons, both in Europe and America. Yet by a curious coincidence in the

very same issue of a Baltimore newspaper containing a reporter's account of the successful operation on Midshipman Aikin, there is a letter signed by an active anti-vivisectionist agitator, which, among other misstatements and misrepresentations usually found in such publications, asserts that "brain surgery is disregarded."

If the laws which you and your friends advocate were in force, the conditions for scientific investigation in medicine in this country would be quite as deplorable as those in England. For example, when Lord Lister, who has revolutionized modern surgery, largely as a result of such experiments, wished to discover possibly some still better way of operating by further experiments, he was obliged to go to Toulouse to carry them out, as the vexatious restrictions of the law in England practically made it impossible for him to continue there these pre-eminently humane experiments.

Again, when Sir T. Lauder Brunton, in London, started a series of experiments on animals to discover an antidote for the cobra and other snake poisons of India, where every year 20,000 human lives are sacrificed by snake bites, these beneficent researches were stopped by the stringent British laws to protect animals. Meanwhile half a million of human beings have hopelessly perished.

Who, I may ask, is the more humane; he who doubtless with the best and sincerest motives of love for dumb beasts would prohibit experiments upon animals and thereby prevent the acquisition of such knowledge and so compel surgeons to stand with folded arms and see innumerable lives thus needlessly sacrificed, or he who by properly instituted experiments would discover such new truths and apply them to the service of humanity?

The anti-vivisectionists have frequently denied that surgeons have learned anything from such experiments. I presume that I may be considered a competent witness as to the source of at least my own knowledge, and I state with the greatest positiveness that without the knowledge derived from experiments upon animals, which have demonstrated the facts of cerebral localization, I should never have been able to locate the clot in Mr. Aikin's head and to remove it, nor would I have been able in the last fifteen years to locate numerous tumors and other brain troubles and relieve many of them. What is true of myself is equally true of other surgeons.

In view, therefore, of the evident and positive benefit of such experiments, I trust that you will be willing to desist from further

efforts at such repressive and, as I regard it, most inhumane and cruel legislation.

As this matter is of vital importance to the well-being of the entire community, I shall take the liberty of giving this letter to the press as soon as you have received it.

W. W. KEEN,
Professor of Surgery, Jefferson Medical College.

December 5, 1902.

SENATOR GALLINGER'S REPLY.

Washington, Dec. 14.—Senator Gallinger of New Hampshire (who is a homœopathic physician), gave out the following letter to-night on vivisection, in reply to the published letter of Dr. W. W. Keen, of Philadelphia, sent him a week ago:

DEAR SIR: Reviewing your letter of December 5, 1902, which you gave to the press of the United States, respecting your success in the case of Midshipman Aikin, I note four points:

First—That self-advertisement is prohibited by the ethics of our profession.

Second—That misrepresentation is forbidden by the ethics of mankind. No measure that would prohibit vivisection, or prevent any of the experiments which you claim were necessary to give you the requisite knowledge in the Aikin case, has ever been introduced by me in the Senate; nor has any such legislation been recommended by me to the Senate. Your statement that I have been engaged in efforts to secure "inhumane and cruel legislation," is without the slightest warrant in fact. I have been engaged in efforts to secure humane legislation that would prevent cruelty. The bills which I favored would, if enacted, only regulate vivisection in the District of Columbia, so as to prevent admitted cruelty, and should have the support of every humane person.

Third—That your argument turns entirely on an assumption which cannot be maintained, namely, that the localization of the functions in the brain of man has been determined by experimentation on animals. The brains of animals differ from the brain of man and also differ from one another, so that stimulation of a certain part of the brain will produce a certain effect in one animal and another effect in another animal. The long history of experiment on the brains of animals has shown that it is not only

not safe to reason from the brains of animals to that of man, but that such reasoning is not safe as between the brain of one animal and that of another. It has been so in general with animal experimentation.

When such experiment had established a fact with regard to any species of animal the next thing was: "Now, let us see if it is the same in man." The experimenters, therefore, "saw" by experiment in some form upon man, and sometimes the result was similar, and sometimes not. That such experiments upon man, as results of reasoning from the lower animals, have been to a great extent disastrous, is certain, for it is the testimony of great surgeons and physiologists. By "experiment" upon man, I mean, in general, operations upon human beings, with the exception that they would have the same result as they had had with animals.

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Fourth—That you ignore, in your direct appeal to selfishness, that altruism which is the principle of moral progress. To practice cruelty, even in the hope of helping humanity, is to hurt it and to delay the advance of civilization.

Recurring to the suggestion already made that I have never introduced into the Senate or advocated any bill that would prohibit vivisection, I beg to say that the purpose has been to regulate the practice, thereby removing from it the "inhumane" and "cruel" features which have shocked the moral sense of our people.

You will doubtless recall the fact that when you gave testimony before the Committee on the District of Columbia, February 24, 1900, I asked you if you thought it improper for Congress to enact a law saying that a dog or a horse should be put under the influence of an anæsthetic before being cut to pieces or the nerves torn from the brain, and that you promptly replied: "I think it would be most unwise legislation." In view of that reply, do you not think that your charge against me that I am engaged in efforts to secure inhumane and cruel legislation should be withdrawn, and especially so when we have undoubted testimony to the fact that one experimenter is in the habit of plunging dogs for thirty seconds into boiling water; that another fastens a dog to the dissection table, and, discarding the use of anæsthetics, stands above it with a large empty stone bottle, with which he strikes with all his strength a dozen blows on the head; while the same experimenter says that he dislocates both the shoulders, doing it with difficulty?

Another experimenter claims that he has "consecrated" more than eighty large animals, mostly horses and mules, to the ex-

tremest torture possible, not, as he expressly tells us, to solve any problem in medical theory, but simply to see what degree of pain can be inflicted through irritation of the spinal cord.

Another still says that he has invented a new machine, which he calls his "tormentor," and in this fiendish device, which had first been "quilted with long, thin nails," animals are moved about, racked with torment, torn and twisted, crushed and lacerated, hour by hour, until crucified nature could no longer endure, and death comes as a tardy release.

That experimenter says: "I can take an ear, a paw, or a bit of skin of the animal, and by turning the handle squeeze it beneath the teeth of the pincers; I can lift the animal by the suffering part; I can tear it or crush it in all sorts of ways," and he adds that these experiments are repeated day after day "with much delight and extreme patience for the space of a year."

If, sir, to attempt to prevent such barbarous practices brings me under your condemnation, I am willing to have the case submitted to the judgment of the American people.

Are you sure, sir, that you "saved" the life of Midshipman Aikin? Are not blood clots frequently absorbed by the processes of nature, and is it not a fact that in many such experiments death has resulted because of the operation?

Your claim that you located the blood clot because of experiments upon animals may or may not be true, as we have the highest possible authority for believing that such experiments are oftentimes misleading and absolutely without value.

You are doubtless well aware of the fact that many distinguished scientists have asserted that experiments on animals in the matter of localizing brain functions have led to nothing of value, inasmuch as the human brain differs immensely from that of the highest animals.

Professor Ferrier has asserted that "the greatest disagreements imaginable" exist among experimental physiologists on that point, adding: "It seems to me a matter of essential importance that in generalizing as to the functions of the cerebral hemispheres we should be careful lest the hypothesis we adopt, however well it may seem to accord with the facts of experiment on the order of animals, should not stand in flagrant contradiction to facts, equally well established, obtained by experiments on others."

On the general question of the value of vivisection, which I have never undertaken to interfere with, when humanely prac-

ticed, it may be well for me to say that I am fortified in my position by the opinions of many of the leading scientists of the world, including such well-known names as that of the late Lawson Tait, the greatest ovariotomist of the last century, and by Sir Benjamin Ward Richardson, the distinguished English physician, surgeon and scientist, author of a remarkable book on "Biological Experimentation," who acknowledges himself to be a vivisector, but who gives warning to the profession that modern experimentation tends to unfit the physician for the discharge of his duties, summing up his opinion in these words: "Were I again to deliver a course of physiological lectures to qualified hearers I should make the experimental demonstrations on living animals as few and far between as was compatible with duty. They would be exceptional and painless from beginning to end."

What I have advocated is in precisely that line, and in support of the contention that, even if everything you claim in the Aikin case is true, students should be taught the facts that you claim have been established, precisely as they are taught the theory of the circulation of the blood, and not through unnecessary torture on dumb animals. Very respectfully yours,

J. H. GALLINGER.

GERMAN MEAT INSPECTION.

Ambassador Andrew D. White reports from Berlin, July 12 and 14, 1902, that according to an official proclamation the meat-inspection law will go into force in its entirety on April 1, 1903, with the exception of the section which relates to doing away with the second examination of meat once officially inspected. This paragraph will not go into effect until October 1, 1904.

The following report on the new regulations has been received from Consul-General Richard Guenther, of Frankfort:

As the time is approaching when the new regulations concerning the importation of meat and its transportation in transit through Germany will go into force, it will be well to note the following: It is prohibited to import into Germany—

Meat in hermetically sealed boxes and similar vessels, as well as sausages and other mixtures of chopped meats; dog meat; also prepared meat of horses, asses, mules, and other solipeds; meats which have been treated with one of the following substances or

with a preparation containing such: Boracic acid and its salts, formaldehyde, hydrooxides and carbonates of alkalis, sulphurous acid and its salts, hypsulphurous salts, fluor-hydrogen and its salts, salicylic acid and its salts, chloride salts, and coloring substances of whatever nature. The latter, however, may be employed for coloring coverings, if not otherwise prohibited.

Fresh meat may be imported into Germany in whole carcasses only, which if of cattle (calves excepted) or hogs may be in halves. Calves must not weigh more than 165 pounds. With the carcasses, the pleura, peritoneum, lungs, heart, kidneys, and the udder and lymphatic glands, if of cows, must be naturally connected. Carcasses divided into halves must be packed together, and must be so marked and numbered that it becomes at once apparent that the halves belong together.

With cattle (calves excepted), the head or the lower jaw and the masticating muscles must be connected with the carcasses in the natural state; with hogs, the head with the tongue and the head of the windpipe—the brain and eyes may be missing. With cattle, the head may be separated from the carcass, provided the head and the carcass are so marked or numbered that it is at once apparent that they belong together.

With carcasses of horses, asses, mules, and other solipeds, the head, the upper part of the windpipe, and the windpipe, as well as the whole skin, must be connected in at least one place in its natural state, in addition to the pleura, peritoneum, lungs, heart, and kidneys.

Pickled and salted meats, with the exception of ham, bacon, and intestines, may be imported only if the weight of the separate pieces is not less than 8.8 pounds. Smoked meat which has been subjected to a pickling process is to be treated as pickled meat. Meat which has been lawfully inspected in Germany (which fact must be established) and has been exported is not subject to an official examination if reimported.

The immediate transportation in transit under a customs escort or in bond (if by mail, without these restrictions) is not to be considered as importation under the law; such meat in transit is not subject to the provisions of the law, but it must not remain longer in Germany than is necessary. If meats are stored in a customs warehouse, they are not to be considered as for "immediate transportation."

THE LAWS OF THE STATE OF NEW YORK RELATING TO CONTAGIOUS DISEASES OF THE EYE, AND THEIR PREVENTION.*

By FRANK VAN FLEET, M. D.,
Surgeon to the Manhattan Eye and Ear Hospital.

The first of these laws is that formerly known as Chapter 633 of the laws of 1886, to be found in the Revised Statutes as Chapter 667 of the laws of 1900. This law was enacted through the efforts of members of this Academy and others, and it should be, and is, a source of great pride to the people of this community that there are enough public-spirited citizens in every profession, and in all walks of life, who will give time and energy to secure the enactment of laws for the protection of those who, through ignorance or inability, cannot protect themselves from disease and other evils which may threaten them.

This law provides for the appointment of physicians to institutions for the care of dependent children, and can be found in sections 213 and 214 of the statutes above mentioned. It reads after this fashion:

SECTION 213.—Every institution in this State, incorporated for the express purpose of caring for children, except hospitals, shall have a regular physician of its own choice and in good professional standing, whose name and address shall be posted conspicuously near the main entrance. His duty shall be to examine each child admitted, and certify in writing that the child has no contagious or infectious disease, especially of the eyes and skin, before the said child can be admitted to contact with other children. This certificate must be filed with the commitment and other papers. The child must be placed in quarantine until discharged therefrom by the physician.

SECTION 214 provides that the physician shall make monthly reports of the physical condition of the children in the institution and of the existence of contagious or infectious diseases, especially of the eyes and skin.

*Part of a symposium on contagious eye diseases at the New York Academy of Medicine, June 5, 1902.—"Pediatrics" for August, 1902.

The only other law relating to contagious eye disease is one for the prevention or detection of the purulent inflammation of the eye of the new-born infant, known as ophthalmia neonatorum, when in the care of a midwife. This law was originally worded so that it was impossible to secure convictions under it; it was finally repealed and re-enacted as part of a general law for the protection of children. This law provides that any midwife or nurse having the care of an infant shall report any redness or inflammation of the infant's eye to the health officer or to some legally qualified practitioner of medicine within six hours after such redness or inflammation appears; failure to do which is punishable by a fine of $100 or imprisonment for a period not exceeding six months, or both fine and imprisonment.

There are no other laws in this State relating to contagious or infectious diseases of the eye, especially. New York City has another enactment which enables the proper authorities to formulate rules and regulations for the control of contagious and infectious diseases of whatever kind and nature. This is the power vested in the Board of Health. The law relating to contagious ophthalmia is a State law. That it has been enforced, to some extent at least, in this city, there is no doubt. The figures taken from the reports of the institutions in the Borough of Manhattan for the care of dependent children demonstrate, from the falling off in the number of contagious eye diseases, the beneficent effect of the law quoted, and must be especially gratifying to our friends now living who worked for its enactment.

The law compelling the calling of a physician by midwives and nurses in the event of inflammatory conditions existing in the eyes of infants in their care has also had a beneficial effect. A number of convictions have been secured for neglect in this particular on the part of midwives, and I believe the fact that such a law exists is now known to most of the women who follow the calling of midwifery. I will say for the benefit of all who may not know it, that the Society for the Prevention of Cruelty to Children will prosecute any midwife who has violated this law, if physicians and others who may have knowledge of such violation will acquaint the Society of the fact.

Conditions seem to indicate that some influence has been at work in the State of New York to reduce the proportion of blind people in the total population. According to the figures furnished by Dr. Lucien Howe, the United States census for 1890 showed

seventy-two blind for every 100,000 people in the State of New York, while the figures given us by Dr. Derby seem to indicate that the number has been reduced to one in every 2,500, which would mean a total of forty to every 100,000 persons, being a reduction of thirty-three in every 100,000.

I believe more than one factor has contributed to this reduction. The people themselves know more than they did ten years ago, and among others who have increased knowledge we may number ourselves. Not only is the average of professional attainment greater, owing to the laws governing the practice of medicine, but also those who are especially familiar with eye diseases know more than they or their predecessors knew. The non-medical members of the community are more likely to give prompt attention to ocular troubles than formerly, because of increased knowledge on their part. The increase in hospitals and clinics devoted to the care of these special diseases; the growth of schools for post-graduate instruction for physicians; increased vigilance on the part of the United States authorities in refusing admission to immigrants afflicted with trachoma; all these, and possibly more factors, have entered into the reduction of the proportion of blind persons in the State of New York.

The Desirability of Further Legislation, is one for serious consideration.

I would say, as far as New York City is concerned, there is, in my opinion, no need for further legislation for the control of contagious eye diseases. Whether this is true of other parts of the State I cannot say, but I see no reason why it should not be if other local boards of health, or the State Board of Health, have powers equal to those possessed by our local board.

Sir Edward Coke, the English jurist, who died in 1634, noted alike for his brutality of speech and his legal acumen, is quoted as saying: "Reason is the life of the law; nay, the common law itself is nothing but reason." When authority was vested in the Health Board of this city to enact whatever regulations it deemed necessary to control contagious diseases the lawmakers certainly acted in the light of reason. I am not prepared to say the Health Board should be allowed to continue indefinitely in the possession of all the privileges it now enjoys, but I do believe it is necessary this Board should have very great discretionary powers, and that the right given this Board to create a sanitary code, which it can alter and amend, as the necessities arise, is both wise and just.

It would seem as if nearly every avenue of contagion, including contagious eye diseases, was sufficiently safeguarded by existing law.

The Sanitary Code gives the Health Board the right to exclude any person known to have any disease which is contagious *or dangerous to the public health*, or who has been in contact with any person having such a disease, whether they come from a neighboring city, county or State, or from a foreign State. It makes no difference where one may have obtained authority to come into this city, the authority of the Health Board over-rides all other authority. Under this code the Health Board has the right to declare any disease contagious, *or dangerous to the public health*. The State therefore has safeguarded the city to a remarkable—although not unnecessary—extent, by placing in the hands of the Board of Health power broad enough and arbitrary enough to enable the Board to keep out any disease detrimental to the public health of which it may have knowledge.

I am convinced that one of the most fruitful fields for the dissemination of contagious eye disease is to be found in our public schools. This, too, is a field that can be controlled by the Health Board. The regular corps of inspectors may or may not be able to properly diagnose the presence of all forms of contagious eye affections. I am not prepared to say inspectors can be obtained for the salary paid the regular inspectors now employed in our public schools, who will be familiar enough with this class of diseases to make their services sufficient to properly remove this danger to the eyes of our children attending the public schools. I have no doubt, however, that the necessary funds can be obtained if the Health Board can be convinced that the danger is great enough to warrant the outlay.

Another source from which many cases of contagious eye diseases come is the public bath. During the summer months, which is, of course, the only time public baths are patronized; we have many cases, especially in our free clinics, of purulent, and therefore contagious eye diseases, which date from a visit to one of these baths. Personally, while I have seen a great many of these bath-house cases, I have never seen disastrous results follow; one can easily imagine what might happen, however, as a consequence of neglect in such a case. I am not prepared to recommend a remedy, but would suggest that it might be a subject worth investigation by the proper authorities.

Dr. Walter B. Johnson, of Paterson, N. J., writing on the subject of ophthalmia neonatorum, says the law enacted in New Jersey to prevent the spread of this disease is practically inoperative, and expresses his belief that the only way to secure its enforcement is to amend the law by having this disease placed on the list of contagious diseases, compelling all who have knowledge of the existence of a case to report it to the health authorities. In New York City the health authorities can compel this without further enactment.

I believe the enforcement of all laws relating to the public health should be entrusted to the Health Board, and the function of the medical profession should be to advise the Health Board and to insist on the enforcement of laws designed to protect the public health. The medical profession can mould public opinion, and when the profession does not agitate needed reforms in matters relating to the preservation of the public health it fails in its duty and deserves all the reproach and contumely the community may be pleased to heap upon it.

The Health Board and the medical profession should walk hand in hand for the protection of the public health, and for this purpose we need a thoroughly organized and united Health Board, which, in this city at least, we now have, and a thoroughly organized and united medical profession, which unfortunately we do not have.

I do not at present see the necessity of any new laws for the protection of the public health, believing those we now have are sufficient for the purposes of to-day. I do recommend a closer union and a clearer understanding between the medical profession and the city, county and State authorities, in order that we may accomplish what should be the great object of our profession—the safeguarding of the community against disease and the avarice and dishonesty of those who prey upon the ignorance and superstition of a confiding people.

This can only be brought about by the entire profession uniting in one strong central body, which shall be the recognized mouthpiece of the profession. Such a body acting in concert with the health authorities could easily bring about all the needed legislation for the proper protection of the public health.

FOOD-ADULTERATIONS.

This was the subject of an interesting address given by Hon. John Hamilton, Secretary of Agriculture of Pennsylvania ("Med-

ical News" Abstract, Pennsylvania Medical Society Proceedings, September 27, 1902), who stated that food-adulteration had really begun and proceeded hand in hand with civilization. Enough statistics were given to show the actual state of this deception in Pennsylvania. During the two and a half years ending July 1, 1902, under the auspices of the Dairy and Food Department 3,023 samples of butter were analyzed, only 103 of them being on the market as oleomargarin, and only 61 as butterin. Of these samples 1,019 were found to be butter, 164 renovated butter, and 1,840 oleomargarin. During the same period 1,369 articles of food, including nearly every solid and liquid form, were analyzed, and 783 of them found to be adulterated. More work in this line has been done in Pennsylvania than in any other three States. Four persons are responsible for the control of the food-supply—the manufacturer, the jobber, the retailer and the cook (or the cook's employer). The kitchen causes much disease. Secretary Hamilton believes that the company kitchens, or rather the sinks, are responsible for much of the sickness in soldiers' camps. He would abolish these kitchens, have men mess in fours, use no dishes, eat with a combination knife, fork and spoon out of the vessel in which the food is cooked, and disinfect this vessel by turning it bottom side up over the fire after each using. Physicians must reform kitchen affairs. The furnishing of pure food depends on two agencies—the law and the work of practicing physicians. It was stated that many cases brought to court had been lost by the department because of the conflicting testimony of physicians. Some would testify that certain substances were injurious to health. Others would give an opposite opinion. And the jury every time would believe the latter. The great responsibility of the State Medical Society in this matter was pointed out, and its earnest co-operation solicited.

ANESTHETICS IN DENTISTRY.

In a brochure on "Local Anesthesia and its Application in Dentistry" (Leipsic, Arthur Felix, 1902), Dr. Herman Thiesing, Royal Court Dentist, discusses the twelve anesthetics which have been used in stomatology. He finds that acoin, cocain, Alpha-

Eucain, holocain, orthoform and orthoform-new are less suited because of their greater toxicity; nirvanin, anesin, etc., because of insufficient anesthetic action and other disadvantages; and that Beta-Eucain should be employed. Dr. Thiesing has also used Wilson's anesthetic, but has entirely ceased to employ it, having become convinced that better results are obtained with a one per cent. Beta-Eucain solution; moreover, Wilson's anesthetic is fifteen times as expensive as such a solution.

Beta-Eucain possesses greater anesthetic power than tropacocain, while the duration and intensity of the anesthesia, and the area affected by it, are equal to that of cocain. Besides being three and three-fourths less toxic than cocain, Beta-Eucain possesses the important advantage that its solutions can be sterilized with boiling. The author has never observed œdemas or subsequent pains from the use of boiled Beta-Eucain solutions, though sometimes, just as with tropacocain, bleedings followed its employment, which, however, have always stopped promptly without aid.

Insensibility of the mucous membrane may be easily produced by the external application of a Beta-Eucain solution. The injection of a one per cent. solution (to which eight-tenths of one per cent. sodium chloride have been added) at body temperature is absolutely painless and effects a thorough anesthesia lasting twenty-five to thirty minutes.

From his investigations Dr. Theising draws the conclusion that in dentistry only Beta-Eucain and tropacocain may be considered, and occasionally, if very dilute solutions are to be used, or for application to the unbroken skin, also acoin and cocain.

He himself prefers Beta-Eucain, because it is less toxic than tropacocain and has considerably more anesthetic power. According to the investigations made by various physicians, a one per cent. Beta-Eucain solution produces about the same effect as a four per cent. tropacocain solution. The possibility of intoxication is therefore much greater with tropacocain.

Dr. Theising considers it advisable to employ Beta-Eucain solutions of four different strengths for various purposes. He indicates *two to five per cent. Beta-Eucain solutions* for opening abscesses; excising small tumors; extracting loosened (not inflamed) teeth and roots (deciduous teeth) and the four lower incisors; and anesthesizing the nerv. alveolar infer. on the lingula and on the foramen mentale;

One per cent. Beta-Eucain solutions for extracting the upper incisors, bicuspids and molars; straightening teeth by operation; drilling the alveola; and removing necrotic root apexes;

Two per cent. Beta-Eucain solutions for extracting the lower molars and bicuspids and the four canines; excavating sensitive dentines; and extracting the pulp; and

Three per cent. Beta-Eucain solutions for extracting all teeth and roots in acute periodontitis.

A NEW DEMAND FOR ALCOHOL.

A new demand for alcohol is becoming prominent in Germany. Last year thirty-one million gallons were used for technical purposes and for fuel. For motor wagons and engines of various kinds alcohol has been found a cheap and excellent fuel. It is largely made from beet roots, and is exempt from duty, and is sold at from twelve to fourteen cents a gallon, competing with all forms of motive energy in engines of less than twenty horse power. For motor wagons and light-running machines and small railroads it is cheaper and more practical than coal. Lamps on the plan of the Welsbach with a mantle give out a more brilliant light, and are more economical than petroleum. There is every reason to believe that alcohol will be used as a fuel, and occupy a very prominent place. The evolution of alcohol from a beverage to a fuel is not more startling than other changes seen every day.—"Journal of Inebriety."

ENGLAND'S OLD PERSONS.

A contemporary published a portrait of an old gentleman whom they termed "The King's oldest subject," aged 107. But what about old Mrs. Hanbury of Richmond, aged 108?

Then there is that gracious dame in the Channel Islands, Mrs. Neve, who was born before Marie Antoinette bowed her graceful head beneath the guillotine and who was a laughing little baby when Charlotte Corday was as yet an innocent, happy country girl.

Mrs. Neve is already 110. And what is to be done with the old lady in Yarmouth Workhouse, 112; and the old laborer near Donaghadee, 118?—"London Express."

UNQUALIFIED PRACTICE, though so rampant, occasionally leads to serious consequences. A man named Herring took a house and put up a plate calling himself Hoffmeister, M. D. and M. S. An inquest had to be held on a woman he had given drugs to, but who had strangulated hernia. Herring swore he was qualified, but later was prosecuted for perjury and for gross criminal negligence. The evidence was that the prisoner was formerly a clerk, left his employment under unfavorable circumstances, and for years led a life of gross imposture. A verdict of manslaughter was returned, and the judge said "he could not imagine anything more dangerous than that an impostor should take on himself, for the sake of money, the care of the sick and subject them to his mismanagement. As a deterrent to others he must pass a severe sentence, which was that the prisoner be kept in penal servitude for five years." The indictment for perjury was thereupon dropped. The judge's decision in this case is one of the greatest importance to the profession and will be a wholesome warning to quacks.—London Letter, "Medical Record," November 22, 1902.

AS HE ORDERED.

"London Tid-Bits" tells a story of an anxious mother who brought her daughter to see a famous London physician. The girl was suffering from what some people call "general lowness." There was nothing much the matter with her, but she was pale and listless, and did not care about doing anything, even eating.

The doctor, after due consultation, prescribed for her a glass of claret three times a day with her meals. The mother was somewhat deaf, but apparently heard all he said, and bore off her daughter, determined to carry out the prescription to the letter.

In two weeks she was back with the girl, rosy-cheeked, smiling and the picture of health.

The doctor naturally congratulated himself on his skill, and said, cordially: "I am glad to see your daughter is so much better."

"Thanks to you, doctor!" exclaimed the grateful mother. "She has had just what you ordered. She has eaten carrots three times a day, and sometimes oftener—and once or twice she had them uncooked; and now look at her!"

Another instance of the truth of the old saying, "God heals and the doctor takes the fees."

EDITOR'S TABLE.

SANITARIAN, JANUARY, 1903.

Embarrassment incidental to the death of the intended manager, under the new business arrangements, announced in October number, delays the completion of the organization. Meanwhile:

All Communications, business and otherwise, all exchanges and all publications for review, should be addressed to the Editor, as heretofore: Dr. A. N. Bell, 337 Clinton Street, Brooklyn, N. Y.

NEW YORK TENEMENT HOUSE ADMINISTRATION.

In reviewing the work of the reform administration in Greater New York during ten months in office, this statement was made by the Citizens' Union, through R. Fulton Cutting, relative to the Tenement-house Department:

"The new tenements have proved themselves to be successful, from the point of view of both the landlord and the tenant. Plans for 519 new buildings, costing over $18,000,000, have been filed from January 1 to November 1 of the current year, of which 297 are in Manhattan and the Bronx, and 222 in the other boroughs. More than 1,200 old tenements have been altered in conformity with the law.

"The Department did not succeed in securing its inspectors until early in the summer, or its clerks until late in the summer, and was not able to take over the complaint work from the Department of Health until August 1. It dealt with 3,651 complaints in August, 2,578 in September, and 2,467 in October. As a rule, the orders of the Department are recognized as reasonable and have been cheerfully complied with. The new-law tenements are renting readily at remunerative rates; there are waiting lists for many of them."

Information secured by *Charities* at the Tenement-house Department brings these figures up to date (through November), thus covering eleven months of 1902:

During November plans for 63 new tenements were filed for all five boroughs, making the total from January 1 to December 1, 582, or 341 for the boroughs of Manhattan and the Bronx alone. The total cost represented was $19,518,000, the million and one-

half increase for November being distributed as follows: Manhattan, $1,233,000; Brooklyn, $127,000; Bronx, $118,000; Queens, $39,800; Richmond, $6,900. In the eleven months 1,286 old tenements were altered, and in November alone 2,520 complaints were dealt with.

So much for statistics. Recent articles in several of the leading New York papers review at length the work of the uncompleted year, and give, from an impartial viewpoint, a clear idea of what has been accomplished, and give it, not from a tabulation of figures, but from independent investigations of actual conditions.

SANITATION was the topic at the Second Monthly Conference of the Oranges, N. J., the principal address being given by the Rev. Adolph Roeder and Dr. S. A. Knopf, of New York, whose subject was "How May Institutions and Churches Be Helpful in the Solution of the Tuberculosis Problem?" Miss Belle Ogden McKee read the report of the Civic Sanitation Association for the past year, which told of house to house inspection and educational work in the tenement districts of the Oranges. Three hundred and seventy-seven premises were visited, and one-half of these were inspections of plumbing, draining, and housing conditions. One resident of the tenement-house district said to the inspector six weeks after her arrival, "We are waiting for you on this street. The girls in the factory where I work have heard about you and are anxious to help the work."

MOTHER EDDY ON VACCINATION.—Mrs. Mary Baker Eddy, of *un*-Christian Science notoriety, having been asked by certain disciples what should be done when the ungodly insist upon vaccinating them and their children, returned the wise and canny answer herewith: "Rather than quarrel over vaccination I recommend that if the law demands an individual to submit to this process he obey the law and then appeal to the gospel to save him from any bad result. When Jesus was questioned about obeying the human law, he declared, 'Render unto Cæsar the things that are Cæsar's even while you render unto God the things that are God's.'"

DR. KEEN ON VIVISECTION.—Dr. Keen has made a public rejoinder to Senator Gallinger's reply to his first letter (see other pages of this issue), citing in detail a number of specific instances

in which increased knowledge can be directly traceable to the observations made in the course of vivisection, wholly unanswerable by unauthenticated reports, such as those adduced by the Senator.

THE INSUFFICIENT SUPPLY OF MEDICAL OFFICERS IN THE NAVY is referred to by the *Army and Navy Journal* as follows: "In no branch of the naval service will the manœuvres in the Caribbean Sea be observed with closer attention than in the Bureau of Medicine and Surgery of the Navy Department. All or nearly all of the vessels engaged in those movements were sent to West Indian waters insufficiently provided with medical officers. In some ships with 400 to 500 officers and men, there is ample work for three surgeons. The percentage of sickness increased considerably, even during last summer's manœuvres in the comfortable climate of the New England coast, and it is quite likely that there will be a still greater increase among the crews of the ships now assembled in the less bracing climate of the Caribbean. It is unfortunate, therefore, that any ship should have been sent to the manœuvres without a full complement of medical officers, but as we have repeatedly pointed out, the blame for it rests with Congress alone. The attention of that body has been frequently called to the urgent need of a large increase in the Navy medical corps, and in his recent annual report Surgeon-General Rixey appealed earnestly for legislation to that end. He also made a plea for hospital ships for the navy, and the need of such vessels is so plain that it speaks for itself. The manœuvres now in progress probably will, and we earnestly hope they may, be completed without serious injury to the health of the forces engaged, but we do not doubt that it will sharply emphasize the increasing need of additional medical officers and of hospital ships for the navy, not merely to provide greater comfort for the sick and wounded, but to permit of higher efficiency on the part of fighting ships in time of action."

TONKA-TALPA SOAP, a saponaceous vegetable compound (from which it derives its name), to which our attention has been recently called, is an elegant toilet soap; devoid of free alkali, yet remarkable for its emollient, quickly-cleansing and deodorant properties. It combines as freely and as efficiently with hard water as with soft, and in both cases with delightfully pleasant re-

sults. It is made both perfumed and unscented, both alike efficacious, and for both toilet stand and bath exquisite. It is made by The Stewart Soap Co., Cincinnati, O.

PRIZES FOR ESSAYS ON TROPICAL MEDICINE.—Announcement is made in the *Journal of Tropical Medicine* of the offer of three prizes of the value of £10 each for essays on the following subjects: Sivenright prize for the best article on "The Nature and Treatment of Diseases, Exclusive of Acute Dysentery, Affecting the Lower Part of the Large Intestine, Occurring in Warm Climates"; Belilios prize for the best article on "The System of Drainage and Sewerage (domestic and municipal) Best Suited for Tropical Climates"; Lady MacGregor prize for the best article on "Critical Examination of the Practical Value of Anti-typhoid Inoculation." Intending competitors must send name, address, and the title of the prize to be competed for to the *Journal of Tropical Medicine,* 83 Great Titchfield street, London, W., before February 1, 1903; the essays must be sent to the same address by May 1, 1903, and the names of the winners will be announced in July of the same year. The competition is open to all qualified medical practitioners of any nationality, and essays may be written in English, French, German, Italian, or Spanish.

PRIZES FOR ESSAYS ON ICHTHYOTOXISMUS.—Two prizes, one of 5,000 rubles ($2,575) and another of 1,000 rubles ($515), have been offered for international competition by the Academy of Sciences of St. Petersburg for papers elaborating protective measures against poisoning by fish toxins. The papers may be written in English, French, German, Latin, or Russian, and must be received by the Russian Minister of Agriculture by October 1, 1903.—*Medical Book News.*

EXPOSITION OF COMMERCE AND HYGIENE AT ATHENS.—Acting Consul L. Nicolaïdes reports from Athens, September 9, 1902, that the International Exposition of Industry, Commerce, Art and Hygiene, which was to have been held in that city in October, 1902, has been postponed to the 7th of April, 1903, so as to enable American products and industries to be represented. Mr. Nicolaïdes is informed that many German, French and Italian firms have written to the committee of organization that they will take part in the exposition.

SEWER CONTRACT TENDERS FOR MONTEVIDEO.—Consul A. W. Swalm reports from Montevideo, July 26, 1902:

The Department of Fomento has published the official call for tenders for the construction of the new sanitary works for Montevideo, which will comprise a tunnel cut in the rock, 1,278 meters (4,193 feet) long by 3.65 meters (11.9 feet) high and 3 meters (9.9 feet) wide; a principal collector of about 4,000 feet and a second collector of nearly equal size, together with several auxiliaries, as set forth in the plans and specifications, which may be obtained by application to the Minister of Fomento here, or to the Uruguayan legations in London, Paris and Berlin. The work is estimated to cost something over $3,000,000.

BUBONIC PLAGUE IN MAZATLAN.

Mazatlan, Mexico, Jan. 1.—There is no longer the slightest doubt that the disease now afflicting this city is genuine Asiatic plague, for microscopic investigation proves that bubonic pest bacilli are in the blood of those afflicted with the disease. The plague has grown virulent within the last forty-eight hours, and the alarm, which had begun in some measure to abate, has returned with increased strength.

The people are fleeing from the city at the rate of 300 per day, and some 5,000 persons have gone already.

It is a remarkable fact that more than 50 per cent. of the persons attacked are women.

The news of the recrudescence of the plague at this port has reached the interior towns of the State, and is causing a panic. Sanitary cordons of armed men have been placed around the towns to prevent the entrance of any one from this place.

AN INTERNATIONAL QUARANTINE LEAGUE.

As a result of the recent meeting of the American Public Health Association at New Orleans, the International Quarantine League has been formed with Dr. J. M. Lindsey as president, and a membership of 150 medical men of the United States, Cuba, Mexico and South America. The league accepts the doctrine that the mosquito is the only means by which yellow fever is transmitted, and that the proper protection against an epidemic of yellow fever is the destruction of mosquitoes or preventing them from gaining access to persons ill with the fever. The object of the league is to secure a modification of quarantine against yellow fever, in con-

formity with the resolutions adopted by the International Sanitary Congress at Havana last February.

MALARIA ON THE CAMPAGNA.

Malaria in the Italian Campagna has remarkably diminished of late. It appears from the report of the British Consul at Rome that in 1888 the percentage of the population who were fever-stricken was 21.6. In 1897 the lessons of the mosquito theory began to be applied, and the rate fell to 6.54. Since then more vigorous measures have been enforced, and the percentage has fallen to 3.73. In this matter British science has scored a distinct triumph.—*London Telegraph.*

MORTALITY AND MORBIDITY REPORTS AND REVIEWS.

NEW YORK.—Monthly *Bulletin* of the State Department of Health for October reports the percentage of deaths under five years of age in the districts into which the State is divided, severally, was, for the Maritime District, 32.5; Hudson Valley, 17.2; Adirondack and Northern, 21.7; Mohawk Valley, 21.0; Southern Tier, 19.0; East Central, 15.3; West Central, 14.1; Lake Ontario and Western, 22.5; entire State, 27.0.

The death rates, respectively, were: Maritime District, 16.3; Hudson Valley, 14.5; Adirondack and Northern, 12.5; Mohawk Valley, 15.0; Southern Tier, 13.5; East Central, 14.0; West Central, 12.8; Lake Ontario and Western, 13.0. Total number of deaths from all causes, 9,475. Death rate, 15.0.

The Second Annual Conference of Sanitary Officers, which was held in Albany, October 30 and 31, was in every way successful and satisfactory to the State Department of Health, under whose direction it was projected, and likewise to all its participants. There was a registered attendance of 200, and every county in the State was represented except Allegany, Cortland, Livingston, Putnam, Schuyler, Sullivan, Tioga, Warren and Yates, and from many of them a considerable number of the towns and villages had representatives, as well as from 23 cities. The meeting was favored by the presence of the secretaries of the State Boards of Health of Minnesota and Michigan, Drs. Bracken and Baker, and of Dr. Peter H. Bryce, of the Province of Ontario.

At the opening session Deputy Attorney-General E. D. Warner spoke on the legal aspects of the work of health officers. The various phases of the health officers' relation to the law were extensively discussed. Other papers presented were those of Dr. Peter H. Bryce, on "The Ethical Value of Education in Preventive Medicine"; of Dr. Herbert D. Pease, director of the Antitoxin Laboratory of the Department, on "Antitoxin as a Therapeutic and Prophylactic in Diphtheria and Tetanus," in which he showed that the diphtheria death rate has been reduced almost one-half during the seven years of antitoxin treatment; of Dr. Willis G. Tucker, director of the Bureau of Chemistry of the Department, on "The Use and Abuse of Food Preservatives." Illustrations by means of lantern slides of small-pox in its various cutaneous manifestations were exhibited by Dr. George Henry Fox, of New York; and the "Technique of Vaccination" was a subject presented by Dr. F. C. Curtis. "Garbage Disposal" had able presentation by Rudolph Hering, C. E., on which no one is better qualified to speak, with illustrations of destructors of the type providing for drying and incinerating which was spoken of with favor. These and other papers by Prof. Olin H. Landreth, Consulting Engineer of the Department, on "The Present Status of Laws for Protection of the Purity of Streams"; on "Disinfectants," by Dr. A. H. Doty, Health Officer of the Port of New York; on "The Liberty to be Allowed the Tuberculosis Patient," by Dr. E. R. Baldwin, of Saranac Lake; and on "Vital Statistics," with advocacy of the universal adoption of the Bertillon system of classification of causes of death. The conference ended with a reception at the Bender Hygienic Laboratory, where matters of interest connected with the work done there were exhibited, especially in the manufacture of antitoxin, which is prepared for free distribution to health officers throughout the State.

City of New York.—Dr. Ernest J. Lederle, President of the City Board of Health, made his annual report to the Mayor for 1902, December 31, in part, as follows:

"I am gratified to be able to report that the death rate of New York City for 1902 was 18.74 per 1,000, which is considerably the lowest ever reported in this city. The total number of deaths was 68,082, as compared with 70,803, and a death rate of 20.02 per 1,000 for 1901, which is a decrease in the rate of 1.28 per 1,000, and indicates a saving for 1902 of 4,619 lives. The death rate in each of the five boroughs is also the lowest on record. The an-

nual death rates of the city since consolidation have been as follows: 1898, 20.26; 1899, 19.47; 1900, 25.97; 1901, 20.02; 1902, 18.74."

The report goes on to say that the rate for the old city, or rather the boroughs of Manhattan and the Bronx, for 1902, is 19.49, the lowest ever reported for that section, the lowest previous record being in 1899, when the death rate was 19.81.

The epidemic of measles in the first four months of the year, the report continues, caused an increase in the number of deaths over the year 1901 for the same months of 1,100. A decrease in the number of deaths from sunstroke over the previous year—there being 1,244 less this year—brought things out about even. The usual visitation of influenza was of short duration and few deaths resulted.

Regarding consumption, now classed under the head of infectious diseases, the report says that there were 582 deaths less than in the year 1901. The report declares that the decrease in the death rate from this disease is due to scientific measures, and states that "the control of the white plague and its ultimate eradication" is being brought about.

There was a slight increase in the deaths from typhoid fever for last year, but a decrease of 100 deaths from small-pox evened things again. Dr. Lederle says that over 800,000 persons were vaccinated by the Board of Health physicians alone. In scarlet fever, there was a slight increase in the number of deaths, but in diphtheria there was a decrease of 35 per cent.

The report states that for the first time in twelve years there was a decrease in the death rate from cancer.

There were 4,907 more births and 2,653 more marriages in 1902 than there were in the year previous.

CALIFORNIA.—No official reports, but according to latest reports through other sources, *bubonic plague* still lurks in San Francisco: three cases, all fatal, occurred in November.

COLORADO.—Denver, 150,000. Bureau of Health report for October: Total number of deaths, 210—39 under 5 years; deaths from phthisis, 43; diphtheria, 5; scarlet fever, 1; typhoid fever, 12; erysipelas, 1; cancer, 5; death rate per 1,000 per annum is reported to have been 16.80. Infectious diseases reported: diphtheria, 50; scarlet fever, 42; typhoid fever, 52; small-pox, 7; erysipelas, 3.

CONNECTICUT.—Mortality reports for November, 1,083—50 less than in October, and 21 less than in November of last year, and 32 more than the average number of deaths in November for the five years preceding.

The death-rate was 14.6 for the large towns, for the small towns 13.2, and for the whole State, 14.3. The deaths reported from infectious diseases, including diarrhœal, were 220, being 20.3 per cent. of the total mortality.

DISTRICT OF COLUMBIA, 292,367—89,632 colored. Weekly report, December 27, 1902: The deaths during the past week numbered 111, the death rate being 19.7. In the previous week they amounted to 113, representing a death rate of 20.1, and in the corresponding period of last year 105, death rate 19.03. Of the decedents last week 64 were white (death rate 16.3), and 47 colored (death rate 27.3). Mortality from disorders of the brain declined from 17 to 13, diseases of the heart from 14 to 12, kidney from 10 to 6, consumption from 14 to 13, and those among children under five years of age from 33 to 28, and under 1 year old from 25 to 20. There were 2 fatal cases of typhoid fever, 3 of whooping cough, and 1 of measles.

Cases of typhoid fever were carried forward from the previous week to the number of 253. During the week 17 new cases developed and 23 were discharged, leaving 247 cases under medical care at the close of the week. Of scarlet fever 25 cases were in quarantine at the end of the week. New cases to the number of 5 were reported and 7 were discharged, leaving 23 cases, with warning cards in 17 premises. There were 28 cases of diphtheria in quarantine at the close of the week. New cases numbering 9 developed and 17 were discharged, leaving 20 cases under supervision in 13 premises. There was one case of small-pox, the first since November 19.

ILLINOIS.—Chicago, 1,820,000. Statement of mortality for the week ended December 27, 1902, compared with the preceding week, and with the corresponding week of 1901. Death rates computed on estimated populations of 1,820,000 for 1902; of 1,758,000 for 1901: Total deaths, all causes, December 27, 1902, 598; December 20, 1902, 625; December 28, 1901, 507; respective death rates, 17.12, 17.98, 15.03. Principal causes of death for the same weeks, respectively, were: bronchitis, 22, 30, 24; cancer,

19, 20, 21; consumption, 50, 55, 39; diphtheria, 18, 15, 15; typhoid fever, 39, 35, 5; whooping cough, 12, 5, 0; violence 15, 61, 53.

The Typhoid Bacillus and Lemon Juice.

There would seem to be sound hygienic wisdom as well as good dietetic taste in the use of lemon juice with raw oysters. Scores of local outbreaks of typhoid fever have been traced to oysters—among the more notable recent ones that at Atlantic City last fall, that among Yale students a year ago or more, and that following a mayoral banquet in England only a short time since, and which numbered among its victims the Dean of Winchester. The *Department* advises those eating raw oysters to drench them with lemon juice in view of the following:

On Christmas morning a cable dispatch from London was published in Chicago, announcing the discovery by Dr. Asa Ferguson, of the former city, that lemon juice has the power of destroying the typhoid fever germ or bacillus. The commissioner immediately caused an investigation to be made by the Laboratory experts. At the close of office hours on Saturday they were able to corroborate Dr. Ferguson's claim and to make—in non-technical language—the statement that lemon juice, in the proportion of one teaspoonful to half a glass—about four ounces—of typhoid-infected water, is sufficient to destroy the vitality of the contained germs and thus to prevent their production of the toxin or poison which causes typhoid fever.

Dr. W. H. Park, bacteriologist of the Department of Health of New York City, however, after several experiments, December 30-31, to determine the value of lemon juice in destroying typhoid bacilli, and microscopical examinations of cultures of typhoid bacilli which had been subjected to the action of the lemon juice, reports that, although the acid killed the micro-organisms, it required too much acid and too much time for the chemical action to take place to render lemon juice a practical agent for their destruction. Dr. Park's negative opinion in regard to the efficacy of the acid as a typhoid prophylactic was corroborated, for after the bacilli had been acted upon by a 5 per cent. solution of the acid for thirty minutes it was found that all of them had not been destroyed. The culture that had been subjected to a 1 per cent. solution showed in thirty minutes one-fifth as many colonies as the untreated culture, while in the case of the one-tenth of 1 per cent. solution there were half as many colonies at the end of half an hour as there had been in the original untreated mixture. Motile

bacilli in small numbers were still visible in a drop of the 5 per cent. solution, after thirty minutes' treatment. It is far safer, he thinks, to boil the water or filter it properly than to trust to lemon juice to destroy any typhoid bacilli that may be in it. Of course, the statement that the acid would destroy any typhoid germs that might be contained in oysters by sprinkling it on the outside is ridiculous.

INDIANA.—The Secretary of the State Board of Health reports for November, 1902: Small-pox, for the 22d consecutive month, was the most prevalent disease; 441 cases were reported, with 2 deaths, in 40 counties. In the corresponding month last year there were reported 186 cases, with 2 deaths, in 15 counties. This comparison shows an increase of 137 per cent. in the number of cases, and 166 per cent. of area which was invaded, the deaths being the same. In October, typhoid fever was the second most prevalent disease, but in November rheumatism takes second place. According to the reports, the order of prevalence was as follows: Small-pox, rheumatism, tonsillitis, bronchitis, typhoid fever, pneumonia, influenza, intermittent fever, scarlet fever, pleuritis, diphtheria and croup, diarrhœa, erysipelas, whooping cough, inflammation of bowels, cerebro-spinal meningitis, dysentery, cholera morbus, measles, puerperal fever, and cholera infantum.

The total number of deaths reported was 2,406, a death rate of 11.6. The rate for the corresponding month last year was the same. Deaths, according to important ages, were: Under 1 year of age, 355, or 15 per cent. of the total number; from 1 to 5, 178 deaths, or 7.9 per cent.; 5 to 10, 72, or 3.2 per cent.; 10 to 15, 65, or 2.8 per cent; 65 and over, 579, or 25.7 per cent. From important causes, the number of deaths and rates per 100,000 were: Pulmonary tuberculosis, 279, rate 135.2. Other forms of tuberculosis, 30, rate 14.5. Typhoid fever, 146, rate 70.7. Diphtheria, 59, rate 28.6. Scarlet fever, 24, rate 11.6. Whooping cough, 12, rate 5.8. Pneumonia, 181, rate 87.7.

The cities, representing a population of 857,845, show a death rate of 15.5. This is an increase as compared with the corresponding month last year, and it is 3.9 more than the average for the State. The city tuberculosis rate was 153.5 per 100,000, which is 18.3 more than the State rate. The typhoid rate was 82.4 per 100,000, or 11.7 more than the State rate. The country shows a death rate of 9.7, and also a lower death rate than the

cities for pulmonary tuberculosis, typhoid fever, diphtheria, pneumonia, diarrhœal diseases, puerperal fever, cancer and violence.

LOUISIANA.—New Orleans, 305,000—81,500 colored. Report for November: Total deaths, 580—187 colored; 128 under 5 years —47 colored. Annual death rate, white, 17.23; colored, 27.53: 19.95. Deaths from typhoid fever, 11—3 colored; tuberculosis of the lungs, white, 32; colored, 20; cancer, 18—5 colored.

MASSACHUSETTS.—Boston, 589,838. The report for October: Deaths, 960—323 under 5 years. Death rate, 19.53. Deaths from typhoid fever, 23; smallpox, 10; scarlatina, 8; whooping cough, 16; croup and diphtheria, 22; cerebro-spinal meningitis, 6; tubercle of the lungs, 100; other tubercular diseases, 16; bronchitis, 39; broncho-pneumonia, 37; pneumonia, 57; heart disease, 82; acute nephritis, 35; Bright's disease, 8; cancer, 47. Contagious and infectious diseases reported: Cerebrospinal meningitis, 2; diphtheria and croup, 195; pulmonary and laryngeal tuberculosis, 74; measles, 22; scarlatina, 101; smallpox, 55; typhoid fever, 171; chickenpox, 16.

MICHIGAN.—The Secretary of the State Board of Health reports for November, 1902, compared with the preceding month: Tonsillitis, influenza, pleuritis, pneumonia, measles, smallpox and meningitis were more prevalent; and typhoid fever, intermittent fever, scarlet fever, diphtheria, cholera morbus, cholera infantum and dysentery were less prevalent. Compared with the average for November in the 10 years, 1892—1901, pleuritis, measles, smallpox and meningitis were more than usually prevalent; and consumption, typhoid fever, intermittent fever, erysipelas, remittent fever, cholera morbus, cholera infantum and dysentery were less than usually prevalent.

The Most Dangerous Communicable Diseases.—Meningitis was reported present at 7 places; *whooping cough* at 27 places; *smallpox* at 31 places; *measles* at 48 places; *diphtheria* at 78 places; *typhoid fever* at 119 places; *scarlet fever* at 143 places; and *consumption* at 240 places. *Meningitis* at 1 place more; *whooping cough* at 8 places less; *smallpox* at 7 places more; *measles* at 6 places more; *diphtheria* at 7 places more; *typhoid fever* at 54 places less; *scarlet fever* at 5 places less; and *consumption* at 1 place less, in the month of November, 1902, than in the preceding month.

Deaths reported to the Department of State for the month of November, 2,357, a decrease of 3 from the preceding month. The rate was 11.7 per 1,000 population, as compared with 11.4 for October. There were 409 deaths of infants under 1 year; 159 deaths of children aged 1 to 4 years, inclusive, and 703 deaths of elderly persons aged over 65 years. Important causes of death were as follows: Pulmonary tuberculosis, 129; other forms of tuberculosis, 34; typhoid fever, 65; diphtheria and croup, 51; scarlet fever, 25; measles, 7; smallpox, 1; whooping cough, 23; pneumonia, 201; diarrhœa and enteritis, under 2 years, 57; cancer, 127; accidents and violence, 155.

MINNESOTA.—Minneapolis, 240,000. Registry of deaths for November, 1902: Deaths, 200—45 under five years; death rate for year ending November 30, 11.11. Deaths from typhoid fever, 10; tubercle of the lungs, 20; other forms of tuberculosis, 1; diphtheria and croup, 11; cancer, 10.

St. Paul, 170,000.—Report for November, 1902: Deaths, 100—23 under five years; death rate, 7.05; deaths from typhoid fever, 5; diphtheria, 2; tuberculosis of the lungs, 9; cancer, 7.

MISSOURI.—St. Louis, 621,000—39,000 colored. Report for November, 1902: Deaths, 763—200 under five years. The annual death rate per 1,000 during the month was, white, 13.95; colored, 26.46: 14.73. Deaths from scarlet fever, 20; diphtheria and croup, 18; whooping cough, 3; typhoid fever, 31; fevers, 9; pulmonary tuberculosis, 88; bronchitis, 24; pneumonia, 45; other diseases of the respiratory organs, 28; cancer, 27.

NEW HAMPSHIRE.—Report of the Commission on State Sanitarium for Consumptives: Tabulated statistics of deaths from consumption for 18 years, 12,937; annual average, 783; percentage of deaths from tuberculosis to total mortality from all causes, 11.26, ranging from 14.93—the highest, in 1884—to 9.04, the lowest in 1899. The need of such a sanitarium is urged, and demonstrated by examples of the beneficial results of their adoption in Massachusetts, in the Adirondacks, N. Y., and elsewhere, illustrated by plans of construction and descriptions of management.

NEW JERSEY.—Hudson County (Jersey City and environs), 409,810. Report for October, 1902: Deaths, 521—179 under

five years; death rate, 15.2; deaths from diphtheria and croup, 20; typhoid fever, 6; all zymotic diseases, 60; consumption, 70; bronchitis, 12; pneumonia, 42.

Newark, 255,000. Report for the week ending December 6: Deaths, 94—28 under 5 years; death rate, 19.16. Deaths from diphtheria and croup, 4; phthisis, 9; bronchitis, 7; broncho-pneumonia, 4; pneumonia, 7; cancer, 2. Contagious and infectious diseases reported: diphtherian-croup, 29; scarlet fever, 31; typhoid fever, 6.

NORTH CAROLINA.—Bulletin of State Board reports for October, 1902: Twenty-six towns with an aggregate population of white, 83,300; colored, 58,850: 142,150. Aggregate deaths, 263—156 colored; 93 under five years of age; still born, 26. Death rates, white, 15.5; colored, 31.6: 22.2.

Deaths from typhoid fever, 18; malarial fever, 16; consumption, 30; diarrhœal diseases, 31; smallpox reported in nineteen counties, an aggregate of 220 cases, no deaths.

OHIO.—Cleveland, 400,000. Report for November, 1902: Deaths, 463—129 under 5 years; annual death rate, 18.89. Deaths from typhoid fever, 12; smallpox, 18; scarlatina, 5; diphtheria and croup, 27; tuberculosis of lungs, 29; bronchitis, 15; pneumonia, 41; heart diseases, 47; Bright's, 17; cancer, 18.

PENNSYLVANIA.—Philadelphia, 1,349,712. Report for week ended December 27, 1902: Deaths, 535—149 under five years. Deaths from consumption, 60; typhoid fever, 14; diphtheria and croup, 16; whooping cough, 5; cancer, 21.

Pittsburg, 346,000. Report of the Bureau of Health for week ended December 20, 1902: Deaths, 138—39 under five years; annual death rate, 20.74. Deaths from typhoid fever, 7; smallpox, 10; consumption, 21; pneumonia, 22; bronchitis, 7; cancer, 1.

Cases of infectious diseases reported: Smallpox, 36; diphtheria and croup, 20; scarlet fever, 12; typhoid fever, 23.

TENNESSEE.—Memphis, 120,000—54,000 colored. Deaths, 176—90 colored; under five years, 3! Death rates, white, 15.63; colored, 19.99: 17.59. Deaths from typhoid fever, 5; other fevers, 20; scarlatina, 3; tubercle of lungs, 24—17 colored; cancer, 7. Report for year 1901: Population, 110,000—49,000 colored.

Deaths, 1,926—1,044 colored. Death rates, white, 14.45; colored, 20.30: 17.50. Contagious diseases: *Smallpox,* 423 cases—336 colored, a decrease of 153 cases as compared with 1900. *Scarlet fever,* 104; diphtheria, 44: "fewer cases and deaths from these diseases, in proportion to population, than any city in the Union."

Deaths from tuberculosis have gradually increased during the past three years. This year 261, or one out of every seven deaths, were due to tuberculosis, but, acting under instructions to have all houses disinfected where deaths from tuberculosis occur, and also those from which patients suffering from the disease have moved, we have reason to expect a decrease in the future.

From *typhoid fever* there were only 44 deaths, and of that number 12 occurred in patients sent to Memphis for treatment. Of the 32 remaining deaths, 31, or 96 per cent., of the patients lived on premises where other than artesian water was obtainable for domestic purposes. Reference is made to shallow wells and seepy cisterns. When these are either put in sanitary condition or filled, typhoid fever in Memphis is expected to cease.

UTAH.—Salt Lake City, 75,000. Deaths, 74—10 under five years. Death rate, 11.84. Deaths from typhoid fever, 2; diphtheria, 6; tubercle of lungs, 2; pneumonia, 5; cancer, 2.

WASHINGTON.—Seattle, 115,000. Report of the Department of Health for November, 1902: Total number of deaths, 75—12 under five years. Death rate, 7.92. Deaths from pulmonary tuberculosis, 9; typhoid fever, 4; diphtheria, 1; cancer, 6. Infectious diseases reported during the month: Scarlet fever, 33; diphtheria, 3; measles, 3; smallpox, 4; typhoid fever, 6; varicella, 5.

WISCONSIN.—Milwaukee, 300,000. Report for November: Deaths, 297—82 under five years. Annual death rate, 12.08. Deaths from typhoid fever, 7; whooping cough, 4; measles, 2; diphtheria and croup, 13; other infectious diseases, 2; pulmonary tuberculosis, 31; other tubercular diseases, 5; cancer, 14.

PORTO RICO, 953,947. Superior Board of Health reports for November, 1902: Total deaths, 2,328—808 under five years. Death rate, 27.1. Deaths from cerebrospinal fever, 21; diphtheria, 2; typhoid fever, 4; pneumonia, 58; puerperal fever, 13;

diarrhœal diseases, 28; anemia, 706; bronchitis, 111; tuberculosis, 132; heart diseases, 24; accidents and violence, 19.

The Climate of Porto Rico.—Dr. Groff thinks (*Philadelphia Medical Journal*) there is no process of acclimatization to persons from a temperate climate in Porto Rico. The trade winds prevent the heat and humidity being oppressive. San Juan is a hot city on account of its being closely built with brick; in other places one needs blankets at night. There are no diseases which one from temperate latitude need fear. Tuberculosis is prevalent owing to the low state of nutrition and the less resistance of the natives. Dysentery is localized, as is leprosy. The anemia of ankylostomiasis is almost invariable among the poor and is spread by eating with soiled fingers. Scarlet fever is unknown. Pneumonia is seldom fatal. Malaria is rare. Yellow fever has not appeared for ten years. Diphtheria occurs, but generally in a mild form, and smallpox has been prevalent in the past. All Americans sometime contract dengue, from which they soon recover. What the people need is instruction in sanitation and better nutrition. They are honest, industrious, intelligent, law-abiding and proud of their American citizenship.

CUBA.—Havana, 275,000—73,000 colored. The Chief Sanitary Officer reports for October, 1902: Total mortality, 412—35 under five years. Annual death rate, 17.63. Deaths from typhoid fever, 3; tetanus, 6; intermittent fever, 5; tuberculosis of lungs, 79; bronchitis, 15; grippe, 3; cancer, 14. Havana and the rest of the island continue to be free from yellow fever and smallpox.

PREVENTION OF RAILWAY ACCIDENTS.

The Railway Safety Appliance Act seems to have greatly decreased the number of casualties to employees. According to recent reports the number of persons killed in train accidents during the months of April, May and June last, according to a bulletin issued by the Inter-State Commerce Commission of reports made by the railroad companies, was 140, and the injured 1,810. Accidents of other kinds, including those sustained by employees and by passengers getting on or off cars, etc., swell the aggregate to 616 killed and 9,250 injured, a total of 10,136 casualties.

The total number of collisions and derailments was 2,010, of which 1,094 were collisions. Of these, 157 collisions and 101 derailments affected passenger trains. The damage to cars, engines and roadways aggregated $1,813,833. The average loss by

each collision was approximately $824, and by each derailment $995. The total casualties during the fiscal year ended June 30 last, including the above figures, was 2,819 killed and 39,800 injured.

The number of employees killed shows a diminution of 68 per cent. since 1893, when the Safety Appliance Act was passed.

OBITUARY.

MAJOR WALTER REED, of the Medical Corps of the U. S. Army, died at the Army General Hospital in Washington, on November 23, at the age of fifty-one years. His death was due to appendicitis, for which an operation was performed on November 17.

Major Reed was born in Gloucester county, Va., in 1851, and was a graduate of the Medical Department of the University of Virginia, and of Bellevue Hospital Medical College in 1875. He was appointed as Assistant Surgeon in the Army the year of his graduation, and at the time of his death was first on the list of majors in the Medical Department of the Army. In 1893 he was appointed Curator of the Army Medical Museum, in Washington. During the Spanish-American war he was a member of the board to investigate typhoid fever in the Army.

In 1900 he was sent to Havana and was placed at the head of the commission appointed to determine, if possible, the cause of yellow fever and the means by which it is spread. Starting from Finlay's theory of the agency of the mosquito in the dissemination of the disease, the commission, by a series of painstaking experiments, demonstrated most conclusively the causal relation of Stegomyia fasciata to yellow fever epidemics, and disproved the theory that the disease could be conveyed in fomites, or that it was contagious in the ordinary acceptation of the term. Sanitary measures based upon the conclusions of Major Reed's commission have freed Havana from the disease.

Major Reed enjoyed the reputation of being a bacteriologist of the first rank. Upon his return from Cuba he was stationed at the Army Medical Museum as curator, a position he had occupied nine years before, and one for which his attainments eminently fitted him. He was also professor of bacteriology and pathology in the Army Medical School, and lecturer on those subjects in the Columbian Medical College of Washington.

BOOK REVIEWS.

INDEX-CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, UNITED STATES ARMY. Authors and subjects. Second Series, Vol. VII, Hernia-Inquiry. It contains, besides, the seventh addition to the list of abbreviations of the titles of medical periodicals published in Vol. XVI of the first series of the Index-Catalogue. The text makes 1,003 pages, and excellently gotten up in conformity with the preceding volumes of the greatest work of its kind.

PROGRESSIVE MEDICINE, Vol. IV, 1902, maintains its excellence. Contains "Diseases of the Digestive Tract and Allied Organs," by Max Einhorn, M. D.; "Anæsthetics, Fractures, Dislocations, Amputations, Surgery of the Extremities and Orthopedics," by Joseph C. Bloodgood, M. D.; "Genito-Urinary Diseases," by William T. Belfield, M. D.; "Diseases of the Kidneys," by John Rose Bradford, M. D., F. R. C. P.; "Physiology," by Albert P. Brubacker, M. D.; "Hygiene," by Charles Harrington, M. D.; "Practical Therapeutic Referendum," by E. R. Thornton, M. D.

It is scarcely necessary to say that every one of these essays is a cogent statement of the most advanced knowledge of the subject to date. 8vo., pp. 422. Quarterly, $10.00 per annum. Lea Brothers & Co., Philadelphia.

A TEXT-BOOK OF NURSING, FOR THE USE OF TRAINING SCHOOLS, FAMILIES AND PRIVATE STUDENTS, by CLARA WEEKS SHAW. Third edition, thoroughly revised and enlarged. 12mo, pp. 400. Illustrated. Price, $1.75. New York: D. Appleton & Co.

A book replete with knowledge absolutely essential for every nurse who would be competent to care for the sick, and for every mother and housekeeper who would know how to maintain healthful conditions of the house and family.

MILK IN RELATION TO PUBLIC HEALTH, by GEORGE M. KOBER, M. D., Chairman of Committee on Public Health, Civic Center, and Chairman of the Committee on Legislation, Medical Society of the District of Columbia. A brochure of 235 pages, Senate Document No. 441, 57th Congress, June 28, 1902.

Dr. Kober has been long known as a devoted student of hygiene, and of milk in particular, in its relation to public health; hence, upon the introduction of "A bill to regulate the production and sale of milk and cream in and for the District of Columbia," introduced by Hon. Jacob H. Gallinger, December 16, 1901, he was well equipped to supply needful information on the subject, and it is greatly to his credit that he availed himself of the occasion to address the substance of this brochure to the Hon. Chairman of the Senate Committee on the District of Columbia.

It comprehends such a complete summary of the results of the use of impure milk in the propagation of disease, above all, among infants; of the ignorance and carelessness of the milk dealers and pedlers; of the unhealthful conditions of cow stables, and the liability to the pollution of milk from such causes; of foul water dilution and unclean utensils, and the common use of adulterants, as to carry conviction to all intelligent minds. It proceeds to consider what constitutes a pure milk supply. As the result of numerous analyses, gives the standard of pure milk, its chemical constituents; its liability to morbific agents by exposure, when ever so pure, if not properly cared for, even to the extent of acquiring infective properties. It points out the necessity for sanitary supervision of all the conditions related to milk and cream supply: dairy stock, stables, feed and care of cows, milking and care of milk, sickness among milkers and employes. The bill was passed.

Taken altogether, the brochure is replete with knowledge of milk and milk products in all their relations to public health; of the requirements for their healthfulness, and in default of enforcement of such requirements, of the diseases liable to be propagated by their use.

LESSONS AND LABORATORY EXERCISES IN BACTERIOLOGY. An outline of Technical Methods, introducing the Systematic Study and Identification of Bacteria. Arranged for the Use of Students. By ALLEN J. SMITH, M. D., Professor of Pathology in the University of Texas. 8vo, pp. 300. Illustrated. Price, $1.50, net. Philadelphia: P. Blakiston's Son & Co.

A practical work deduced from a series of class exercises, with intervening blank pages for notes: evidently well adapted to its intended purpose, "intended to be supplementary to the general

lecture instruction in bacteriology, and not in any sense to replace such instruction." Nevertheless, it is commendable as an elementary book of bacteriology for students or others who may not find it convenient to attend lectures on the subject.

THE WEATHER. Proceedings of the Second Convention of the Weather Bureau Officials, held at Milwaukee, Wis., August 27-29, 1901. Department of Agriculture, Weather Bureau, Washington.

A pamphlet of 246 pages with illustrations, comprehending a score of papers on the methods and means for advancing the work of the Weather Bureau and discussions thereon of much practical utility to all who would benefit by knowledge of climate. The convention, upward of a hundred of forecasters and others connected with the service, was attended by the Secretary of Agriculture and the Chief of the Weather Bureau. It was welcomed by Dr. W. M. Wilson, of the Local Bureau, who said in part:

"We welcome you as practical workers in a splendid cause. Your labor contributes to the building up of commerce and business, to the building up of cities, to aiding the people who are engaged in the practical pursuits of life. Milwaukee, with the best harbor on the great chain of lakes, with her splendid lake commerce and her wonderful freightage, watches the signals as they are displayed upon the local signal station and trusts them. The work so well begun by Mr. Moore long years ago gives us confidence in the Bureau, and the work so well begun by him has been carried on with fidelity and splendid ability by those who have succeeded him, especially by him who occupies the place of chief of our local office at the present time."

To which Prof. Willis L. Moore, Chief of the Weather Bureau, and President of the Convention, responded, giving a sketch of the Weather Service from the beginning.

The reading of papers followed.

Mr. L. G. Schultz read a paper on "Study of Polarization of Light with Reference to Weather Conditions." Discussed by Professors Abbe and Moore.

Prof. Alex. G. McAdie read a paper on "Fog Studies." Discussed by Professors Bigelow and Moore, Mr. Clayton, and Rev. Father Odenbach.

Mr. M. W. Hayes read a paper on "Value of the Climate and Crop and Storm Warning Services of the Weather Bureau to the Industries of Cuba and Other Islands of the West Indies."

Mr. G. H. Noyes read a paper on "Value of the Climate and Crop and Storm Warning Services of the Weather Bureau to the Industries of Porto Rico." Discussed by Mr. J. L. Cline.

Mr. F. P. Chaffee read a paper on "Meteorology in the Public Schools: How Much Should Be Attempted? Methods of Teaching." Discussed by Messrs. Blandford, Oberholzer, Watts, Clark, and Jennings, Professor Abbe, Messrs. J. Warren Smith, Hackett, Connor, and the chairman.

Mr. G. A. Loveland read a paper on "Meteorology in Colleges: To What Extent Is It Taught at Present? Should It Be Offered as an Undergraduate or as a Post-graduate Course?" Discussed by Dr. Fassig and Professor Abbe.

Dr. W. M. Wilson read a paper on "Climate and Man; with Special Regard to Climate and Climatic Elements as Curative or Causative Agencies of Disease, Etc."

Dr. I. M. Cline submitted a brief "Synopsis of a Course of Lectures in Medical Climatology."

Mr. R. H. Dean read a paper on "Influence of Climate on Animal Life." And a dozen or more other papers, some of which it is our purpose to reproduce.

MALARIAL FEVER: ITS CAUSE, PREVENTION AND TREATMENT. Containing full details for the use of Travelers, Sportsmen, Soldiers and Residents in Malarious Places. By RONALD ROSS, F. R. C. S., D. P. H., F. R. S., Walter Myer Lecturer Liverpool School of Tropical Medicine. Ninth edition, revised and enlarged. Illustrated. Longmans, Green & Co., 91 and 93 Fifth Ave., New York, London and Bombay.

This little book of 80 pages contains the gist of recent knowledge of malarial fever and how to prevent it; where the disease prevails, its germs, and how it is propagated by *mosquitoes;* with a brief account of how to get rid of and how to prevent mosquitoes.

MATTISON METHOD OF MORPHINISM. A Modern and Humane Treatment of the Morphine Disease. By J. B. MATTISON, M. D., Medical Director Brooklyn Home for Narcotic Inebriates. Published for the author. Price, $1.00. E. B. Treat & Co., New York.

A monograph of forty pages, giving the gist of thirty years' experience in the study and treatment of the morphine disease,

with a sketch of the treatment by others, the superiority of his own, and a description of it.

THE FOOD VALUE OF GUM GLUTEN IN COMPARISON WITH OTHER CEREAL PRODUCTS AND SO-CALLED GLUTENS. A complete digest of our present knowledge of its Characteristics and Application in Dietetic Therapeutics. By Prof. NELSON CLARK PARSHALL. Published by The Pure Gluten Food Co., Chambers St. and West Broadway, New York.

"Gum Gluten" is the trade-mark characteristic of wheat gluten produced by this company, which it claims to be of superior quality, more nourishing than meat, and purports to show the sufficiency and superiority of vegetarianism.

CONTEMPORARY LITERATURE.

CHRISTIANITY A PRACTICAL CREED.

Some of the greatest questions with which humanity has ever had to deal are still to be settled—are, indeed, pressing down upon our own time and day with startling actuality. Now, indeed, is the time for the Christian ideals and precepts of purity, of brotherhood, of kindness, of truthfulness, of fair dealing, of charity, to be kept in sight and mind, in international relations, in the relation of races, in the relations between employers and employed—in a word, throughout the entire world of affairs. It is a practical man, a student of economics—the Hon. Carroll D. Wright—who makes the following remarkable statement: "I believe that in the adoption of the philosophy of the religion of Jesus Christ as a practical creed for the conduct of business lies the easiest and speediest solution of those industrial difficulties which are exciting the minds of men to-day and leading many to think that the crisis of government is at hand." From "A Lay Sermon for Christmas" in the December *Century* (Editorial).

HUMAN LIFE.

"Human life has been strikingly compared to the burning of a candle. The flame, as it catches, flutters feebly, so that the least breath will quicken it; and again, when burned almost to the socket, it flickers and easily goes out. Thus the body which in middle life may bear the severest shocks of sickness and privation, in infancy and in old age succumbs to but slightly unfavor-

able conditions. The extinction of life at the end of its natural cycle, after the course has been finished and the allotted work has been done, can scarcely be regretted, but the lives cut off before they are well begun are an absolute loss to the community, of the extent of which most of us have little conception. Health is the normal condition of the human mechanism, while disease and premature death are in large part unnecessary. They are to be overcome, however, not by an abrogation of the intellectual faculty, but by its exercise. Those only who seek ardently to discover, and implicity to obey, the inexorable laws of nature, will survive in the struggle for existence to round out their sum of years and to benefit their kind."—From "The War Against Disease," by C. E. A. Winslow, *The Atlantic* for January.

PROVISION FOR HEALTH AND CLEANLINESS.

It is not to be supposed that during all these years the day nurseries have been neglected by the Board of Health, that one power of autocratic privilege among us which, when even democracy fails to bring about a reform, steps in and brings the unwary to account. The board has been most vigilant in looking after the nurseries, in making inspections, in limiting the number of children admitted; in requiring iron beds and wire mattresses with blankets over them instead of mattresses of any kind; in enforcing the use of hair pillows when any were used; in insisting upon just so much space about and under each bed, and just so many cubic feet of air for each child in the room; in seeing to it that the outside garments of the children are fumigated daily. When an infectious disease breaks out in the tenements, children from that house are not allowed in the nursery until all danger of contagion is over. If there is no regular physician in daily attendance, one must be within call, and any child showing unusual symptoms or eruptions must be isolated at once until its case can be decided upon.

Cleanliness has been made an absolute rule in all nurseries, some of the managers going so far as to decline a child whose mother has been reproved for the third time for bringing her baby dirty. The question of cleanliness, by the way, involves some of the most interesting points in the managers' discussions. Shall a daily bath in the nursery be insisted upon? Shall a child's clothing be changed throughout every day? The settlement of these questions not only involves the nurseries in extra labor, but conflicts

with the prejudices and precepts of parents. One child, found at home "sewed up for the winter," said to her visitor: "Don't rip me. Ma will be mad." So widely do domestic customs differ among us.—Lillie Hamilton French in the December *Century.*

SCHOOL CONSOLIDATION IN THE SOUTH.

Some of the most interesting experiments in rural school consolidation and improvement have been in progress for several years past in the part of the country that has heretofore been regarded as the least progressive in educational matters. In the States of North Carolina and Georgia the conditions are quite different in every way from those prevailing in New England and the Middle West, where the school consolidation movement has attained its greatest impetus. Yet it has been fully demonstrated in each of these States that it is cheaper and better to transport a dozen children four or five miles to a central school than to employ a teacher and provide a schoolhouse for these children near their own homes. The State School Commissioner of Georgia has asked the Legislature to confer upon the county boards of education the authority to consolidate the weak and inefficient schools of a number of sparsely-settled communities into one strong central school whenever, in their judgment, such consolidation is deemed wise and proper. In North Carolina the number of school districts was reduced last year more than a thousand; the patrons of the schools in that State continue to ask for consolidation and centralization. Farther South, in Florida, one county—Duval—has concentrated schools over an area of about one hundred square miles. Here, as in other Southern States, where the transportation system has been introduced, the wagons are owned by the counties. Drivers and teams are hired by contract let to the lowest bidder.—From "The Consolidation of Country Schools: Notes on the Basis and Progress of the Movement in Many States," by William B. Shaw, in the *American Monthly Review of Reviews* for December.

THE MOST AMERICAN BOOKS.

In a group of articles written for the Book Number of *The Outlook,* Owen Wister, Brander Matthews, Hamlin Garland, Col. T. W. Higginson, Edward Dowden, Dr. Edward Everett Hale, and several other authors discuss the rather novel question, What ten books or parts of books are most characteristic of American life and genius? There is a considerable divergence of opinion.

Two lists may be given as together fairly representative. Colonel Higginson's includes Cooper's "Pioneer," Lowell's "Biglow Papers," Hawthorne's "Scarlet Letter," Emerson's "Essays," Thoreau's "Walden," Whittier's "Snowbound," Mrs. Stowe's "Uncle Tom's Cabin," Longfellow's "Hiawatha," Whitman's "Leaves of Grass," Helen Keller's "Story of My Life." Mr. Owen Wister sums up his impression as follows:

Farewell Address, Washington; Gettysburg Address, Lincoln; Phi Beta Kappa Address, Emerson; "The Scarlet Letter," Hawthorne; "When Lilacs Last in the Dooryard Bloom'd," Whitman; "Huckleberry Finn," Mark Twain; "Biglow Papers," Lowell; "Tennessee's Partner," Bret Harte; Autobiography, Grant; and for the tenth, in spite of proximity, I will name "Mr. Dooley," whose sane, profound incisiveness must delight the heart of Uncle Sam as much as did once the "Biglow Papers."

LIFE AND CORRESPONDENCE OF HENRY INGERSOLL BOWDITCH. By his son, VINCENT Y. BOWDITCH. With photogravure portraits and other illustrations. 2 vols. 8vo, $5.00 net. Postage extra. Houghton, Mifflin & Co., Boston, Mass.

THE ATLANTIC MONTHLY for January begins and announces the scope of its chief serial for the year, "His Daughter First," by the distinguished author, Arthur Sherburne, our recently appointed Minister to Spain. Its plot turns upon complications in the money market in New York and love entanglements in a New Hampshire house-party, presenting a striking picture of the most animating aspects of life.

GEORGE M. GOULD'S BIOGRAPHICAL CLINICS.—It is a peculiar fact that the letters and other writings of DeQuincey, Carlyle, Darwin, Huxley and Browning, liberal as they are with reference to the continued ill-health of those great writers, have not before this suggested to the medical profession an opportunity for research into the causal factors of those physical conditions. That the opportunity has not until now been recognized in its proper light is evidenced by the hitherto total absence of any work dealing with this subject. Dr. Gould has gathered from the biographies, writings and letters of the five named men every reference to their ill-health. Dr. Gould's Biographic Clinics (P. Blakiston's Son & Co., Philadelphia), which is devoted to this neglected subject, should, therefore, prove a most unique and valuable

contribution to biographical and medical literature. The work is announced for early publication.

THE ABBEY PRESS, Publishers, of 114 Fifth avenue, New York City, has been incorporated under the laws of the State of New Jersey, with a capital of one million dollars ($1,000,000). This has been found necessary, owing to the rapid growth of the business, and for the purpose of further development, and which, although founded only four years ago, has in this short space of time placed itself in respect to its output in the sixth position among the publishing houses of the United States.

It will also issue a new high class monthly magazine of international scope and character, the plans for which have been maturing for the past two years. The control of the business will remain in its present hands.

THE THEATRICAL SEASON, now at its height, has disclosed no more prosperous and popular combination of amusement enterprise and good business methods than are shown at the seven Proctor theatres, in New York, Albany, Newark and Montreal. High class amusement at extremely reasonable admission rates prevails, and the Proctor Stock Co. of 100 carefully selected artists has become recognized as one of the leading dramatic organizations of America.

The Fifth Avenue Stock Co. has Minnie Seligman as its leading lady. Presentations of the best works by popular dramatists are made with weekly changes of bill, and vaudeville of excellent class is engaged to keep the performances continuous.

The Twenty-third Street Theatre presents the best vaudeville in continuous performance, the leading stars of America and Europe finding place in the constantly changing and diversified programmes.

Proctor's theatres in Albany, Newark and Montreal are enjoying a season of unusual prosperity. Newark presents exclusive vaudeville bills, and continuous vaudeville is given at Proctor's Twenty-third Street, in New York. The Proctor Stock Co. has possession in Albany and Montreal.

BULLETINS, REPRINTS, ETC., RECEIVED.

Dietary Studies in New York City in 1896 and 1897, by W. O. Atwater, Ph.D. Bul. 116, U. S. Department of Agriculture, Washington, D. C.

SANITARY SCIENCE.

A SYNOPSIS OF SANITARY SCIENCES AS REPRESENTED IN THE SANITARIAN, ALPHABETICALLY.*

BY THE EDITOR.

MARINE HYGIENE OF PASSENGER VESSELS.—"Whoever will take the pains to become familiar with the unsanitary conditions of ocean travel for about fifty years previous to and at about the time when the modern sanitary movement took its rise in England, will be at first struck with the graphic descriptions of the proverbial "middle passage"—of human beings stalled, packed and shipped as merchandise. . . . A ship of 1,000 tons measurement, and with only 500 tons steerage, could take steerage passengers for her whole tonnage: 400 instead of 200. This object was wholly a secondary consideration, and provided for extemporaneously, by the temporary filling up of superfluous space unsuited to merchandise; or, after all the merchandise obtainable had been taken on board—at the last moment before departure. Ten deaths for every hundred passengers during the voyage of such vessels was considered healthy; and from twenty to thirty, for every hundred, not uncommon. The Lark arrived at Quebec Aug. 12, 1847, from Sligo, whence she sailed with 440 passengers, of whom 108 died on the passage, and 150, sick at the time of arrival, almost all died soon after. The Virginius sailed with 496; 158 died on the passage, and 186 sick on arrival, nearly all of whom died within a month. Taking all the data accessible," etc.—A. N. BELL, M. D., v, 145.

Marine Hygiene and the Prevention of Epidemic Disease, by Commerce, A. N. Bell, vii, 481.
Marine Hygiene: Protection from Scurvy on Long, and Especially During Arctic Voyages, T. J. Turner, xii, 393.
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THE UNITED STATES WEATHER SERVICE.*

By Prof. WILLIS L. MOORE, Chief of the U. S. Weather Bureau, Washington, D. C.

It is interesting to recall that in 1870 this weather service had its inception. It is also interesting to note that the appropriation at that time was $20,000, and that to-day the people of the United States spend nearly one million two hundred thousand dollars annually for this service, and are satisfied with the expenditure; for the service has not been compelled to petition anybody for its maintenance for many years. Congress has freely given us every dollar we have estimated for in the past four years. Away back in 1870, and prior to that time, there were a few indefatigable workers whose object was the creation of an institution that was finally to send to Milwaukee such a convention as this. Dr. Lapham, whom every one in Milwaukee loved, was one of those earnest workers, gentle in his way and modest in his demeanor. He and our own Professor Abbe [applause] did more than any other two persons to create the present weather service. Redfield, Espey, Loomis, Maury, Coffin, and other scientists had demonstrated the theory of storms as we understand it to-day. Neither Lapham nor Abbe added materially to that theory, but Abbe collected observations of the weather in 1869, with the aid of the Cincinnati Chamber of Commerce and the Western Union Telegraph Company, and began making forecasts for the purpose of giving an example of what could be done. Lapham collected records of some 2,000 disasters on Lake Michigan, the majority of which would have been averted had there been a weather service. Lapham went to the National Board of Trade and there got resolutions. He made such a lucid argument with the facts that he

*Presidential address at the opening of the Second Convention of Weather Bureau Officials, at Milwaukee, Wis., August 27, 1901.

presented that finally a Congressman from Wisconsin, Gen. Halbert E. Paine, introduced in the Congress a resolution appropriating the $20,000 to which I have just referred.

From that modest beginning has grown the weather service of to-day. It embraces an area from the north coast of South America to the remotest confines of Canadian habitation, and from the Atlantic to the Pacific. It is the greatest survey of atmospheric conditions ever presented to the eye of the forecaster, and if meteorology, in its weather predictions, comes to be an exact science, it will be due to the energy and liberality of the United States Government in presenting such a magnificent daily picture for the study of the meteorologist. If it ever comes to the time when we can forecast the character of the coming seasons, so that the farmer may conserve his energies and spend them to the most profitable advantage, it will be due to the scientific study of such a broad atmospheric picture as the United States daily presents. It will not be due to chance.

When we began the weather service there was but little attention paid to us, except by the funny paragrapher. We were abused and ridiculed sometimes; more often treated with good-natured jest. The old mariner laughed at us; he sailed in the face of the storm signals, and delighted to do it. It was a long time before we convinced him of our value; and in fact we did make a great many mistakes in those days, and it was a long time before we were entitled to the confidence of the marine interests. But to-day hardly a ship sails, the master of which does not take cognizance of the weather map, daily forecasts, and storm signals. Down in New Orleans, when the recent storm came in from the Gulf, our official issued warnings that the papers of New Orleans say reduced the wreckage on the open waters at least $1,000,000. He was able to say to Galveston what was just as valuable to it as the storm warning was to New Orleans, viz.: "You need have no fear; this storm will go northward and not strike the Texas coast. Only don't let your vessels sail out into it." That reassured the Galveston people and prevented their being panic-stricken.

I wish now briefly to refer to some important innovations that have taken place as a result of our convention at Omaha. New instrumental equipments have been placed at nearly all weather stations, so that nearly every observatory to-day is equipped with standard self-recording apparatus, whereas before but few even of our first-class stations had such adequate apparatus. We have erected at more than one-half the marine ports tall steel towers

for the display of marine warnings, where before the warnings were displayed from anything to which a lantern could be tied. We have experimented to determine the most powerful lantern we could make that would be suitable for our use. We have inaugurated in the lake region what we call the lake marine service, with headquarters at Detroit, and we have made a study of the fog areas, so that at different seasons of the year the mariner may know on what portions of the different lakes he will meet the greatest percentage of fogginess. It was simply the establishment of the normal, that is all; but, by collecting the records from many vessels, we are able to say where, during certain seasons, there will probably be encountered the greatest amount of fog. The extension of the forecast system has been important. By co-operation with Mexico we now exchange observations with that country. By an extension of the service as an incident of the war with Spain we now have a service that covers the West Indies and surrounds the Gulf of Mexico. By a recent arrangement with the English meteorological office we get daily observations from the west coast of Europe. By the completion of the German cable from Lisbon across to the Azores and thence to New York we get observations from the Azores which are highly valuable in making warnings for the guidance of transoceanic steamers. The extension of the marine part of our work has resulted in enabling our forecasters to make fairly accurate ocean forecasts for outgoing steamers. We have to interpolate a little for the pressure of the North Atlantic, but it is found that our estimate is highly valuable to commerce and is accurately made. Most of the things that I have referred to are important innovations that the marine interests have been seeking for years, and we are glad they have been obtained. Many other things that were discussed at our Omaha convention, as you know, have been incorporated in the weather service. I think the most profitable instruction I have ever received as chief of this service came from listening to your discussions at that convention three years ago. This is a coming together of supervising officials. One rubs up against another, gathers his ideas, takes them home, and applies them to his own work. It is a sort of clearing house for weather ideas.

One of the last and most important innovations in the weather service has been accomplished through the co-operation of Mr. Machen, Superintendent of the Rural Free-Delivery Service. We have had the hearty co-operation of the Post-Office Department, and to-day the mail carriers going out into the rural districts carry

with them little slips containing the daily forecasts, and Mr. Machen finds it one of the most popular features of the rural free delivery. This part of our work will be greatly extended in the future.

There is another innovation that I hope to have made. I have not yet presented it to the Secretary of Agriculture, but I believe he will give it his approval, as he has always shown a disposition to favor anything that means help to the Weather Bureau. That is the construction of individual observatories in every city where we have a station. So far Congress has freely given us money to build separate meteorological observatories at isolated places on our various coasts. We are constructing six this year. I propose to place the matter before Secretary Wilson, so that he may place it before Congress, with a view to completing a few buildings each year, so that in a city like Milwaukee there would be erected a Weather Bureau building that would be in fact a Weather Bureau observatory. I believe that Congress will approve this.

One word about the discipline of the service and I am through. I think this convention, as I look over the faces of those present, speaks for itself of the merit system. It is the intention of the central office that only men of tried capacity, men who possess both ability and good character, shall be selected for the responsible positions of the weather service. Secretary Wilson has exacted of me only one condition in the making of recommendations to him for preferment in the service, and that is that my recommendations shall be fairly made. It has been my honest endeavor to place before him only the names of the men who were best fitted and most entitled to advancement when promotions were to be made. I have tried to discharge this duty righteously. I may have made errors. I may not, at times, have satisfied some, but I believe that I have satisfied the majority, for I can truthfully say that there has never been a preferment in the weather service since I have been Chief of the Bureau in which any consideration entered except the welfare of the public service and the merit of the official. As an instance, I may cite the fact that last winter Congress created an additional professor and three additional national forecasters. Now, that act became law the latter part of January or the first of February. I did not make the nominations to the Secretary until the 1st of June, and during that interval there was not a letter or personal application received from any person asking for any of these places. There was no inter-

cession on the part of outside influences in behalf of any man in the service, and I think that fact is the strongest evidence that our people are willing to rest their cases with the central office and allow it to select the men for important commissions unhampered by selfish intercessions.

CLIMATE AND MAN: WITH SPECIAL REGARD TO CLIMATE AND CLIMATIC ELEMENTS AS CURATIVE OR CAUSATIVE AGENCIES OF DISEASE.*

By Dr. W. M. WILSON, Milwaukee, Wis.

The distribution of the climatic elements of a country determines its fruits and flowers, its industries and activities, and the character and temper of its people.

The world's greatest workshop is bounded by the tropics and the arctics, and neither the torrid zone, where life is made too restful by nature's bounteous provisions, nor the frozen North, where existence must be wrested from the unwilling sea and soil, is conducive to the highest development of the race. Practically all of the world's great industries are centered within the limits of the temperate zone, and thus far every effort to plant a great nation outside this narrow belt has proved a disastrous failure. Gigantic schemes, with elaborate and refined preparations for the colonization of the tropics, have always been met by the insurmountable barrier of death and disease, until the West Indies have come to be called the "Graveyard of Europe."

France has been one of the foremost nations in the promotion of these enterprises, and French literature is full of ingenious explanations for each successive failure, which, after a more or less devious path through the social and political questions of the time, usually arrive at the same fundamental conclusion, that the climatic conditions of the tropics are unsuited to European civilization.

An English authority, Benjamin Kidd, has pronounced in no uncertain terms against the possibility of the white man ever being able to pass the tropics, assuming that past experience has

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shown beyond the shadow of a doubt that nature, by the interposition of the deadly climate of the tropics, has placed a natural barrier in the way of further progress in that direction which may not be passed with impunity. With all due regard to these eminent authorities, one who approaches this subject with an unbiased mind cannot fail to be impressed by the absence of any attempt to classify or analyze the characteristics of the various maladies which produce such disastrous results and the perfunctory way in which the whole responsibility is placed upon climatic conditions.

The influence of climate upon the origin and cure of disease is a question of very great importance, not only to promoters of industrial enterprises in tropical countries, but to the great army of health seekers that make annual pilgrimages to the famous health resorts in search of a climate which will restore youth or cure disease. It is a matter of common knowledge that most infectious diseases exist only within certain limited areas. Some have their home in the tropics; some, like tuberculosis, acknowledge no geographical limitation, and seem destined to overspread the whole world; while others, like diphtheria and smallpox, are gradually being crushed out by modern prophylactic methods, and may even be tending toward extinction. On the summit of high mountains infectious diseases are unknown, and in the "farthest north" the earth and air and sea are as free from harmful germs as though sterilized in the laboratory of the chemist.

The tendency of diseases to become localized in their distribution has given rise to a general belief that the cause for their origin and propagation must be found in the prevailing climatic conditions, and that for this reason certain climates, especially the tropics, are absolutely unfitted for the habitation of the white man, while others are endowed with healing qualities akin to those ascribed by the ancients to certain springs. During the past twenty-five years, however, scientific experimentation with reference to the origin and propagation of infectious diseases has revealed some startling truths, the discoveries in this field of research undoubtedly constituting the greatest achievements of modern medicine. It is now positively known that many of the diseases heretofore ascribed to climatic conditions result from the presence within the body of a specific germ or living organism, the life history of which is as well known as that of the most common insect, and that by proper hygienic precautions, one may live in the very presence of this most deadly enemy in comparative safety.

The discoveries have a most important bearing upon the subject of medical climatology; for, while climatic conditions may in a measure favor the development and activity of the germs of disease, the responsibility for their invasion of the human body is thus shifted from impersonal, irresponsible climate to a responsible individual, who, when having knowledge of the proper prophylactic measures to be employed, fails in the necessary hygienic precautions, must suffer the consequences of neglect. The thinkers of to-day are gradually reaching the conclusion that the healthfulness of any locality or section is not so much a matter of climate as a matter of hygiene; and when medical science shall have studied the diseases indigenous to the tropics with the same zeal and success that has attended the investigations into the etiology of the ailments of the temperate zone, one can live in a tropical country, under proper hygienic precautions, perhaps with less personal comfort, but certainly with no more danger, than in the most favored spot in our own country.

Smallpox has few terrors for the present generation, but this scourge has claimed its victims by the tens of thousands. It is not climate, but scientific sanitation and hygiene, that has wrought the change. Yellow fever will no more wreck our Southern cities when the breeding pools of the mosquito are eradicated; and when the so-called climatic diseases of the tropics are as well known and the proper precautions observed that "graveyard of Europe," the West Indies, will become the veritable garden of the world, and the words "acclimated" and "immune" will disappear from our language.

Climate as a cure for disease, in the broadest sense, rests upon the same general principle. A specific disease must be reached by a specific remedy, and, strictly speaking, climate, so far as known, possesses no qualities which would entitle it to such a position in the materia medica. The claims made by the promoters of certain health resorts that the richness of the air in ozone, the resinous gases from the pines, the peculiar purity of the atmosphere in a particular locality, or the elevation or aridity of the air acts as a specific in certain diseases, are not generally based upon scientific investigation, and usually have their origin in the fertile brain of the advertisement writer.

It is common knowledge that the principal components of the atmosphere are in practically the same proportion the world over, that the amount of moisture varies with the locality and season, and that rarefaction results from an increase of elevation; and

while it is true that elevation tends toward increasing lung capacity and that excessive humidity retards in a measure the excretory action of the skin, it has not been shown that the absence of moisture has any specific influence upon those diseases for which a dry climate is so frequently recommended, or that a rarefied atmosphere is essential to the destruction of the germs of disease. On the other hand, there is ample experience to show that persons suffering from troubles associated especially with tuberculosis are frequently benefited by a residence in the humid air at the level of the sea as well as in the dry and arid atmosphere of our Western plains.

We must, therefore, look further than to mere climatic conditions for the cause of the cures which sometimes certainly do result from a change of residence. The human organism, both in health and disease, is so complex in its operations, so delicately poised, and the relation of the mind and body so interdependent, that environment, whether it be of climatic or of social conditions, while not acting directly, may, through the senses, exert a powerful influence upon the vital forces. This influence of environment is all the more potent in that class of diseases in which continued ill-health and lowered vitality allow the shattered nervous system to respond readily to external impressions, and in these cases a change of residence is frequently of the greatest benefit. Nature itself is the best doctor, and, when supported by environment and proper medication, may be relied upon to use all the forces at command against the inroads of disease. That climate may play an important part in the curative process is not denied, but that the climate of certain localities possesses any peculiar properties which act as a specific on certain diseases is neither borne out by scientific investigation nor unbiased experience.

In the selection of a place of residence, climate should be considered only in its effect upon comfort and congenial surroundings and with a view to a constant outdoor life. Pure air, which can be found almost any place outside of great cities, and the maximum amount of sunshine are the two essentials.

That the temperature is not important is shown by the excellent results obtained by a residence in the Adirondacks, where the cold of winter is frequently intense. That a dry atmosphere is not essential is evident from the equally good results obtained in the arid climate of our western resorts and the humid atmosphere of the Southern States. That rarefaction is not a requisite is shown by the cures effected both at sea level and at high altitudes. With

complete relief from care and anxiety, good food, pleasant occupation, and a constant outdoor life, one may fight a winning battle against disease in almost any climate, whether it be in the arid, rarefied atmosphere of Colorado or New Mexico, the soft and genial warmth of Florida, or the more rigorous climate of the New England States.

SANATORIA.

EXISTING CONTINENTAL MODELS.*

By Mr. Cecil C. Brewer.

Existing sanatoria as to their plans may roughly be divided into two classes: Firstly, those built on a concentrated plan; and, secondly, those on the cottage or block system—that is to say, they vary from the large hotel-like buildings, such as Falkenstein and Hohenhonnef, in Germany, both having five floors, to Nordrach and the American cottage sanatoria, with quite small blocks, having two floors at most. In comparing the two systems, it must be remembered that Nordrach, perhaps the most successful of all these sanatoria, is on the cottage plan, and there can be no doubt that, from a purely medical point of view, this plan is best; but the disadvantages in working are many and obvious, both as regards convenience and economy.

The medical requirements are extremely simple. Every part of the building must be:

(1) Well ventilated.

(2) Free from dust and easily cleansed.

(3) Patients' rooms, in addition to abundant fresh air, must have as much sunlight as possible, and must be protected from cold winds.

(4) The building must be as sound proof as practicable.

The perfect sanatorium, therefore, will be the one that fulfils these requirements, and at the same time is convenient of management and supervision, provides reasonable comfort for patients in all weathers, and has not too much the appearance of a hospital or barrack, but which must not, on the other hand, degenerate into the hotel or hydropathic establishment.

*Paper read at a meeting of the Architectural Association. From "The Surveyor," December 5, 1902.

At Nordrach, which is rightly called a colony, the various buildings are scattered throughout the village at some considerable distance apart; some of them have been especially built, but others, such as the administration and staff offices and some patients' blocks, are merely old buildings converted, and I think it is generally admitted that the success of this sanatorium has been due to management, strict *regime*, and the personal magnetism and enthusiasm of Dr. Walther, the founder, rather than to its buildings or site.

Nevertheless, some recent sanatoria in this country have been built closely following the Nordrach plan. One lately built, which I have seen, has its dining-room, kitchen and staff offices on one side of a little valley, and the patients' rooms on the other, at least 200 yards away, and with no other means of communication between them than an uncovered and unsheltered path. Now, considering that in any sanatorium a certain proportion of the patients must be confined to bed, and must at the same time be provided with substantial and appetizing meals, such a plan is surely absurd, and I can see no reason why, because a sanatorium in the Black Forest has succeeded, in spite of such an arrangement, that we should handicap ourselves with it in England—and the cottage system seems unsuitable to our climate—but would rather suggest the large building spread over as much ground as possible, and so arranged that the parts may be easily isolated.

I propose now to show you the plans of some sanatoria built in Germany and elsewhere on the concentrated plan, discussing them as they are upon the screen.

Falkenstein.—I have placed this first, as it was one of the earliest, and now is, perhaps, the best-known German sanatorium, having been much advertised lately through the visit of our King, and it happens to be one which I have myself seen. This building, which was erected in 1876, accommodates 112 paying patients on five floors, of which I have only been able to obtain the main or ground-floor plan. There is a basement below this occupied by very large stores, bath-rooms and offices, with a veranda in front, and above are three floors of patients' rooms. The layout is ingenious, but it is doubtful whether the central recess on the plan is an advantage, for the rooms in the centre are somewhat deprived of sun.

The building generally is too much of the hotel type, and the number of sitting-rooms is altogether excessive and harmful; they

are difficult to supervise, and are a temptation to patients to spend too much time indoors; it being now generally admitted that patients when indoors should be as much as possible in their own rooms, which can be thoroughly ventilated, and where talking and forbidden amusements are not indulged in. There are also too many mouldings, decorations, curtains and other dust-traps about the building. The water-closets are not detached from the main building, and the ordinary baths are poor, except for the douche, etc., which are much used, and which are situated in the basement under the staff-rooms, and here the bathing is done under medical supervision and the taps are placed outside the rooms. The dining-room, the one really important sitting-room in a sanatorium, though a fine room, is not well placed, having only north and east aspect. The patients' rooms are 13 ft. to 14 ft. high, which is quite unnecessary and even inconvenient, 8 ft. 6 in. to 9 ft. having been found in practice to be quite an efficient and convenient height. But to take the chief objection to this plan last, the patients' rooms are placed on both sides of corridors, and it has become an axiom that patients' rooms should only be placed on one (and that, of course, the south) side of a corridor; in other words, that your patients' block must only be one room thick. This has been realized in Germany now as well as in England, as you will see in the plans of more recent German buildings which I shall show immediately.

Let me first show Hohenhonnef. This closely resembles the Falkenstein plan, but is, I think, an improvement on it, as it should be, having been built sixteen years later. The wings here are shorter, so that the centre is not so shut off from the sun. The dining-room with east and west aspects and the complete blow through is better; and on the upper or patients' floor the central portion is only one room thick, and the water-closets are partially isolated. But we get the same excessive number of sitting-rooms and the same number of stories. In both these sanatoria, which are for paying patients, there are bedrooms for visitors and friends of patients, and these, together with the number of reception-rooms, lead one to suppose that the life more nearly approaches to that in a large hotel than would be allowed at Nordrach, and certainly the general aspect of Falkenstein, when I saw it three years ago, was very different to that of the newer and stricter English sanatoria.

Ruppertshain.—This sanatorium for the poorer classes, built about six miles from Falkenstein in 1895, is, as regards

plan and arrangement, a great improvement on the former. The building was originally planned to accommodate men in the west and women in the east wing, and was so being used when I visited it; but a new sanatorium for women was then being built close by, and the whole of the old building was to be given up to men. The arc form is distinctly good, although the thickening of the ends seems a mistake and overshadows the rooms next to them. Here you will notice that the room and corridor plan has been adopted, so that by the use of fanlights over doors an excellent blow through may be obtained. You will notice that a dining-room and a day-room are the only sitting-rooms provided, but that there are ample open-air galleries. The basement contains, beside the day-rooms, douche-room, stores, cellars, heating chambers, etc.

On the first and second floors the dining-rooms occupy the centre, one being for men, the other for women, and there are small pantries off them—a certain amount of the light housework being done by patients, both men and women. The bedrooms are arranged for one, three and five beds respectively, but at the time of my visit they were being used for larger numbers than these. This dormitory arrangement can only be tolerated on the ground of expense, and possibly in the case of very poor patients who, Dr. Walker tells me, do not always appreciate the luxury of a single room. But anyone who has slept for many nights in the next room even to a coughing consumptive patient will realize how essential separate rooms are.

Here the sanitary arrangements are fairly isolated, and for the most part good, except for the earth-closets, which are of a strange and wondrous pattern—that is to say, they are on the soil-pipe plan—this pipe being a 9-in. glazed stoneware one, and as it bends and twists, and is jointed to connect to the closet below, the result may be imagined, and I could well believe the doctor when he assured me that they must shortly be abolished and water-closets put in.

The two small buildings on the extreme west of the plan are objectionable, being pig-styes, and comfortably placed between the open-air gallery and the scullery. In spite of these objections the buildings are well laid out and built, and as there is no ornament, and reasonable precautions are taken to avoid the lodgment of dust, they struck me as in every way better than those at the parent institution, Falkenstein.

Alland.—This sanatorium, which was opened in 1897, is thirty miles from Vienna, and at present accommodates 118 patients, but the grounds, farm, laundry, lighting, laboratory and other blocks are sufficiently large for a sanatorium for 300, and new patients' blocks will shortly be built to bring the number to this total. This sanatorium is particularly interesting to us in England at this moment, as in its present size and completeness it closely approaches the King's scheme. It is intended for patients of the poorer classes, the charges being about 30s. per week for first and 12s. per week for second class patients.

You will see by a glance at the ground-floor plan that the patients are accommodated in dormitories as at Ruppertshain, but here each dormitory accommodates eight patients, except for six small rooms to accommodate two each. The layout of this main patients' block is fairly good as a whole. The sanitary blocks are not, of course, sufficiently isolated for English ideas. But the chief fault lies, to my mind, in the size of the dormitories, and the fact that each acts as a passage-room for at least one other. As at Ruppertshain, the washing is done in the lavatories and not in the bedrooms, excepting in the case of patients confined in bed, and, where dormitories are used, this is the best arrangement; though where separate rooms are provided it is a very vexed question as to whether washing and bathing should be done in the rooms or not. At Nordrach, where great stress is placed upon bathing, each room is provided with a shower bath, and in other sanatoria a fixed lavatory is placed in each room. The disadvantages in having wash and supply pipes in rooms are so obvious that I think it is better to have all washing and bathing done in separate rooms, allowing wash-stands and baths, which may be connected only to the first class of patients and to those too ill to walk to the bath-rooms.

The dining and kitchen block are to the southeast of and rather lower than the patients' block, the ground floor being on a level with the basement of the latter, to which it is connected by a covered way. There are two basements to this block, used for cellars, servants' rooms, offices, etc. This dining-hall is a well-placed room, and the cooking arrangements seem excellent.

Alland, like the projected King's sanatorium, has a fine laboratory block, with mortuary and dissecting-room, also a scientific library, and accommodation for one or two foreign medical men who may wish to visit the place for purposes of study; there are

also an electric light house, laundry and model farm. These are detached from the main building, and as they are similar to those which must be provided for any general hospital, I do not intend to describe them—the whole is very well and fully set out in the Alland Sanatorium Association's report, published in Vienna, which contains full plans, diagrams, etc.

Albertsberg.—I have included this among my slides, for though I can tell you little about it, it seemed an interesting plan for an inexpensive poor patients' sanatorium, the cost having been but £125 per bed against £173 per bed at Ruppertshain and £240 at Alland. The dormitories here are for ten beds each, but there are said to be eight single-bedded rooms in the block behind the dining-room. This seems a mistake, for they must, unless the slope in the ground is very great, be somewhat cut off from light and air. Another very obvious fault is that the open-air galleries are too much sheltered between the blocks; but there seems an idea in the plan, and the use of the dining and sitting-rooms as passages seems an expedient to which no real objection can be taken.

Before leaving these German sanatoria, let me add that they all, except the last, appear too high, having five floors. This, even though the stairs be made easy of go, places too great a strain upon consumptive patients.

Now, gentlemen, having shown you plans of several German buildings, only some of which I have seen, may I be permitted to show you the plan of a small English sanatorium which I know well—namely, that built for the East Anglian Sanatorium Company at Nayland, Suffolk, and of which Dr. Walker is the medical director. This building was originally intended for twenty-eight paying patients, but seven more rooms were fitted up in the roof during construction. You will see here that slightly radiating wings were adopted, and, I believe, the angle which these make with the centre has been found to be about right—that is to say, they afford a certain amount of shelter without shutting off the sidelight from the centre. Each wing contains six ordinary patients' bedrooms (10 ft. by 14 ft. by 8 ft. 6 in.) on each floor, and larger bay rooms at each end; those next the open-air galleries being given up to staff officers' rooms, so that control is always kept over patients in the galleries and also over the corridors. Practically the whole width of the south wall is window from 2 ft. 6 in. sill-level to the ceilings. A corresponding light is put in right across the north wall of the room above 6 ft. high, and

again in the corridor opposite, so that a complete blow through can be obtained.

The sanitary blocks are placed centrally behind the patients' blocks, and a nurse's room at each end close to the secondary staircases. The administration block is at right angles to the main block, with a passage through to the dining-room, which is an almost detached room. The small passage connecting the administration block with the dining-room was originally planned as an open veranda, but after one or two southwesterly gales, which had an unfortunate knack of upsetting nurses' trays passing to patients' bedrooms, glass screens had to be fitted, which in really fine and settled weather can be removed. Now, if one short length of corridor open on one side proved itself inconvenient here, it seems to me that a cottage or villa block sanatorium could never be a success in English climate unless the blocks were connected by enclosed passages either above or below ground, or unless each block was provided with kitcheners and full equipment for serving meals, and either of these two expedients would be exceedingly extravagant, and I cannot see that there would be corresponding advantages.

But to return to the plan before us. Stretching eastwards from the dining-room come the kitchen and offices, with extra larders and stores in a basement under the east end of the block. Here an open corridor is provided, but there is a passageway through kitchen and pantry, which can be used in windy weather. There is no first floor over the dining-room and kitchen block. On the first floor over the administrative block a pathological-room, and sewing and linen-rooms. The front portion of the first floor is similar to the ground floor. On the top floor on the east side are patients' room, and on the west, nurses' and servants' rooms. You will notice that owing to the slope of the ground the administrative blocks are midway between the ground and first floor patients' room, so that the patients on either floor have only to go up or down one flight of steps to reach the dining-room.

I have chosen these plans from those available, almost haphazardly, I am afraid. Open-air sanatoria are being built all over Europe and North America. They are to be found in Africa, and I learn from the highest authority that Wei-Hai-Wei is considered a suitable position. In Switzerland, of course, are many of the best-known ones, though I do not think that these are constructed on the latest and most scientific methods, which I am endeavoring to describe to-night.

But having seen these few plans, you will probably have realized how extremely simple the planning of small sanatoria is. Difficulties, undoubtedly, increase enormously directly the numbers to be accommodated increase. You are then at once confronted with the question of area covered, and distance from dining-room and kitchen, and the number of floors allowable. As it is exceedingly important that patients should dine in the general dining-room as often as possible, this question of the distance of the patients' rooms from the dining-room is really a vital one. It has sometimes been suggested that the buildings should be built on a great number of floors and lifts provided. Against this there are two objections—(1) the fear that the lower rooms may ventilate into the upper; (2) the expense of running the lifts, which would have to be very large, as they would be chiefly used in going to and from meals, and therefore by practically the whole of the patients at once.

As to construction, everything that applies to general hospital construction applies here, but an effort should be made not to give the place too much of the hospital air. In this climate verandas outside the bedrooms are generally considered a mistake. The open-air galleries should be placed either in between the rooms (I have sometimes wondered whether the ideal plan would not be to have one between every alternate room), or at the ends of corridor or quite away from the house. They should not be less than 10 ft. deep, and there should be ample space laterally, say 8 ft. to each person. When I visited Falkenstein and Ruppertshain the couches in the open-air galleries seemed much too close together.

Ventilation.—In some German and, I believe, some American sanatoria mechanical ventilation is resorted to. But this seems a great mistake—one of the objects of the treatment is the hardening of the patients, and for this there can be nothing better than open windows. Casements opening in have been found the best form of window. Sashes only allow of half the window space being used for ventilation, and casements opening out are most troublesome and noisy in windy weather. The upper parts of the windows should be hopper hung or on centres, and it is a good plan to have lift butt hinges to the casements, so that they may be taken right away in hot weather.

Open fireplaces, except for appearance in sitting-rooms, are not advisable on account of the dust, and low-pressure steam is

generally admitted to be the best form of heating. Hot water would, of course, be preferable, were it not that in sanatoria the temperature of rooms may fall below freezing, and there is a danger of burst pipes, and as the radiators are chiefly used for a short time while patients are dressing, hot water will not heat them rapidly enough. Besides, with very long, low buildings, such as I have been advocating, hot water cannot be efficiently used.

The best position for the radiator in patients' rooms is another point, I think, to be settled. I show you three plans of patients' rooms at Falkenstein, at the East Anglian Sanatorium, and at a sanatorium recently designed. The position of the radiator in the last, under the windows, has been severely criticised by doctors as not efficiently heating the room, and the other position is probably the best. The foot of the bed has been suggested, and the place seems an excellent one, were it not for the difficulty of moving the bed. The radiators should be fixed at some little distance from the wall to allow of dusting behind, and should be of such a pattern that a brush can be used between tubes.

The doors of patients' rooms and open-air galleries should be made large enough to allow of beds being wheeled in and out with ease. The flooring of patients' rooms and corridors is a question to which a great deal of attention has been given—smooth, plain linoleum is probably the best for both. Tiles, parquet or mosaic are excellent, except on account of noise, and this is of the very greatest importance. Sanatoria with long lengths of corridor and a number of rooms, having both doors and windows opening on to them, are apt to be so noisy as to have a really bad effect on nervous patients, and everything in the way of rubber door stops, silent window fastenings and noiseless floor coverings must be adopted. Probably the india rubber flooring now used in banks, etc., would be the best if expense allowed. The floors of the dining-room may very well be of hard wood, and of the open-air galleries unglazed tiles.

Fixed hanging cupboards running up to the ceiling are better than wardrobes, as dust underneath, behind and on the tops of the latter is avoided. Electric light is, of course, the best form of illuminant, and its advantages are so great that it should be installed almost at any cost. It is necessary to have the fittings arranged so that the lamps shall not swing and be broken by the draughts that blow through the rooms, and, of course, to have the switches in patients' rooms within reach of the bed. It is

also well to have at the same point an extra plug which may be used for keeping plates warm or for a lamp for examining throats. Here also should be fixed the push of the bell to ring in the servants' bedroom.

As to the height of rooms, I have previously said that 8 ft. 6 in., or 9 ft. at most, has been found a good and convenient height. I have no doubt that there are many who will criticise this, and it is not in accordance with the custom in Continental sanatoria, where rooms vary from 12 ft. to 14 ft. The advantages of low rooms are:

(1) The reduction in the height of the building, consequently in the number of stairs.

(2) The reduction in the cube, and consequently the cost of the building.

(3) The convenience of cleaning, the top corners being easily reached with an ordinary mop.

(4) The ease of opening the top lights of windows.

But, of course, with such low rooms the windows must be tight up to the ceiling. After all, if patients are to live in a constant stream of fresh air, I cannot see that it matters whether that stream is 8 ft. 6 in. or 14 ft. deep.

Before concluding, may I recapitulate what seem to me the chief points to remember in designing the ideal room of a consumptive patient? The room should face south or southeast; should be ventilated back and front, as should be the corridor behind. The windows should be the full width of the room, and the sill low enough for the patient to see out when lying in bed, and should be carried right up to the ceiling; they should open inwards, and to their full extent, as well as being entirely removable. Open fireplaces should be avoided, and the heating provided should be such that the room may be warmed speedily. The doorway should allow the bed to pass. The room should be as close to dining-rooms, bath and water-closet as possible, and separated from them by the least number of steps. The usual hospital precautions against dust should be taken, and the walls and floor should be made as sound proof as possible. In conclusion, let me recommend to any one wishing to study the subject Dr. F. R. Walker's exhaustive work, "Sanatoria for Consumptives," to which I am indebted for some of the plans I have shown to-night.

COSMOPOLITAN HEALTH STUDIES.*

By F. L. Oswald, A. M., M. D., Author of "Physical Education," "The Remedies of Nature," Etc.

XVI.—AUSTRALIA.

In 1788, when the first British colony was established in New South Wales, the German philosopher Herder argued that a superior race could not flourish in a country which, *per naturam,* had produced only inferior creatures.

But the supposed question of climate may, after all, depend upon accidents of ocean currents. Cuba and Yucatan, less than three hundred miles apart, and warmed by the sun of the same latitudes, differed like wealth and starvation in their original fauna: two hundred and eighteen different species of mammals in the Mexican peninsula, and only twelve on the Queen Island of the Antilles, and those twelve including eight kinds of bats.

Australia and the West Indies happened to be out-of-the-way islands, surrounded by marine abysses that were never bridged by the reefs that originally connected Sumatra with the neighboring continent. The indigenous products were scant, but the soil had for ages been waiting for better guests, and imported seeds sprouted swiftly, exulting in the absence of competition.

The prosperity of assisted immigrants, indeed, often led to unexpected results. A variety of wild roses, brought from Wales by some sentimental colonists, now cover the plains in measureless thickets, and English conies multiplied till the hills, for hundreds of miles, are honeycombed by their burrows. Poor Puss had met her chance. Some of her favorite British food-plants might be absent, but so were foxes, wolves, minks, coons and weasels. A plurality of her young survived, and with three litters per year, that meant an annual increase of a thousand per cent.

Man, too, for a while, rejoiced in the absence of his two worst natural enemies: microbes and tithe collectors. Civilization decided to trust itself to a secular basis, and the immunity from consumption, smallpox and climatic fevers could be explained only on the theory that the atmospheric germs of those diseases were

*Continued from p. 505, vol. xlix.

missing. Nature seemed inclined to give the contagion-haunted biped a breathing spell.

Physically, at least, the colonists prospered; their survival was favored by the advantage of a patient transferred from an old pest-house to a new sanitarium. Colonel Mitchell, who had seen Chile and North America, pronounced the Australian squatters the stoutest and merriest Caucasians he had thus far come across.

But, it is true that the physical vigor of those first immigrants was for a long time favored by their nomadic habits. Dim rumors about the existence of precious metals had been circulated as early as 1810; droughts frequently dislodged the stock farmers, and a large percentage of the colonists shifted from place to place, hoping to better their condition, or yielding to that wander-instinct that rarely fails to assert itself under favorable conditions.

In 1835, or more than half a century after the arrival of the first home-seekers, there was not yet a single city, town or village, nor any permanent trading post of more than two hundred inhabitants. Immigrants arrived, but no "settlers." The new-comers soon joined in the gypsy-life fun of their predecessors. In that way contagious diseases got hardly a chance for development. The Outlanders, of course, came freighted with the usual assortment of sanitary superstitions, but before ill-ventilated cabins could hatch catarrh-germs, the owner moved; festering garbage piles were left to shed their fragrance on the desert air.

Wherever a perennial stream held out a promise of drought-proof pasture-grounds, squatters pitched their tents, turned them into tabernacles, after a while, and let their youngsters revel in exploration trips through the neighboring bushland; returning with a lot of unknown berries one day, a litter of never-heard-of quadrupeds the other, but always with keen appetites and other guarantees of sanitary beatitude.

But to the chocolate-colored aborigines these happy valleys proved vales of the upas tree. Once started on the down grade of alcoholism, there was no holding them. They would spend a month's wages in a single carouse; if their cat-eyes and cat-like agility enabled them to collar a keg of rum under cover of darkness, they would open it on the spot and guzzle away at the risk of falling asleep and getting waked with the axe of the enraged proprietor.

Their systems, moreover, acted as microbe-traps where no other human beings would have suspected the existence of disease-

germs. A half hour's visit to a squatter's cabin was enough to saddle them with malignant catarrhs, apt to take the form of pulmonary inflammations.

They knew that, and attributed the homicidal atmosphere to the Prince of the Air—"de white man's devil, he get in you and play h——, till you cough him out again;" but in their mad greed of rum they could not stay away, and after hanging about and watching their chance with blood-shot eyes, for a day or two, they resolved to enter what they considered a trap of the arch-fiend.

"Any work for poor man, Borkah?"

"Oh, you don't want to work."

"Any old cloth?"

"You'd sell them for liquor if you get hold of them. Go away."

"Where shall I go, Mistah?"

"Oh, go to Hades!"

"All right;" then, after some reflection: "Give me just one drink before I go?"

It is a mooted question if the poor wretches' passion for liquor was a spontaneous one; but the probability is that they began by watching Caucasian barbecues, accepted an invitation; did not relish the first or second sample of firewater, but persisted in reliance on the white man's superior wisdom.

They soon found that they could not share the immunity of his transgressions, but hope to be luckier by-and-by; they are converts to the doctrine of metempsychosis, and expect to get reincarnated in the form of white men or white horses—they are not particular which.

"Do you really not care for a pardon?" the Court asked a young native, convicted of killing a colonist for a pound of tobacco.

"Hang away," growled the defendant; "my ghost he come back in big white horse, and him you never catch."

Where did they come from? A plausible theory traces their origin to the Loo Choo Islands, east of Korea. Like the natives of that Pacific Archipelago, they settled quarrels by family arbitration, and were ignorant of archery. If their traditions can be trusted, they arrived some five hundred years ago, were repeatedly decimated by cannibal invaders, but always recovered with the aid of their tutelar spooks.

Against Caucasian invaders, however, those benignant spirits appear resourceless. The native population has died out at a frightful rate. Firewater alone could not account for the sudden

collapse of their vitality, and in the case of the protected Tasmanians it seems to have something to do with the crushing sense of inferiority—physical and intellectual. Subventions precluded the risk of famines, but the reservations resembled leper camps: shy, listless and life-weary bipeds wandering about, or sitting in groups, silent, awaiting the end. Somehow or other, life evidently had lost its value for them. If they married they took no interest in the survival of their progeny, and the birth-rate itself steadily decreased.

Perhaps it was a case of meddle-mania, constant supervision and ceaseless interference proving fatal to a peace-loving race. Under easy-going Spanish-American masters—*quien sabe?*—they might have survived. The British philanthropists ought to have shipped them to Mexico.

In the vast bushlands of the Darling River valley a few independent tribes have held their own. They will not work, but are in great request as scouts, and unrivaled in the role of sleuth-hounds. There seems not the slightest doubt that they are able to follow a moderately fresh trail by scent. Professor Kennedy and the Brothers Dempster mention black detectives who followed criminals through rock wastes where *visible* tracks were lost, and, after sniffing about a resting place for a couple of minutes, could indicate the time of the fugitive's start: "Left here this morning," "Was here yesterday," or whatever the symptoms might be.

Immunity from catarrhs; non-obstruction of the nasal ducts enjoyed for a long series of generations, facilitated that development of a sense which our indoor modes of life threaten to eliminate as completely as the "sixth sense" of our migratory fellow-creatures. And that loss may have been a blessing in disguise. In the crowded cities of the coast-plain those sable policemen suffer martyrdom. They can "smell a rat" a block away; a dead cat in a suburb without leaving the business quarter, and are in danger of assassination when their chief assigns them to a revenue job; in Sydney one of these spotters was actually scared off by threats; the managers of "speak-easies" had no chance against his inevitable proboscis.

City growth began in 1836, when Adelaide was selected as the entrepot of a prosperous farming country, but became phenomenal less than fifty years ago. In 1855 an average of fifty thousand immigrants per month arrived all summer; gold had been discovered in scores of river valleys, and broken the spell of the *dolce far niente.*

Melbourne shot up as rapidly as San Francisco; Sydney doubled its population year after year.

And yet, through all that period of storm and stress, the sanitary luck of a New-found-land befriended the southern colonies. The increase of the death-rate was due chiefly to deeds of violence, and, after the re-establishment of social order, became so low again that, in the words of a Melbourne physician, "the rum-soaked immigrants seemed to be kept alive by the magic of good fortune" —they prospered in spite of intemperance, and began to consider the expedience of taking care of themselves.

In Melbourne the supply of drinking-water was at first miserably inadequate; one rainy season, so-called, was limited to half a dozen light showers; springs failed. Digging did produce water, but so strongly impregnated with mineral solutions as to require distillation. Thus modified, it could be bought at a penny a pint, a little less than the price of beer.

In their distress, the poor fell back upon the foul fluids of the Yarra Yarra River, naturally impure, and now contaminated with all sorts of refuse. Typhoid fever seemed inevitable, but made its appearance in an epidemic form only in the third summer, when long impunity had encouraged the masses to drink slightly filtered river slime like spring-water.

And even then the penalty came only in transient forms; zymotic diseases, after flickering for a month or two, subsided of their own accord, or thanks perhaps to the activity of the ice factories that had been established in all parts of the city. From a sanitary point of view, the long drought, in fact, proved a self-limited evil; it dried up springs, but also hundreds of festering pools.

Drinking-water, or anything that deserved that name, had to be manufactured by private enterprise, even when Melbourne had become one of the wealthiest cities of the Southern Hemisphere. The Board of Health had agitated the grievance for years, and could at last not be plausibly baffled by doubts about the permanence of the enlarged population. In 1856 the city reached the 100,000 mark, and before the end of the next winter a sudden spurt of activity created an artificial lake, known as the Yan Yean reservoir, some eighteen miles up the valley of the Planta River.

Since that time, pyretic disorders have been kept in check. The death-rate from pulmonary disorders, on the other hand, has ominously increased; there is no doubt Dr. Koch's pets have at

last colonized the province of Victoria. Indoor life and Saxon architecture have led to their natural consequences.

In Adelaide the water-supply was always abundant, in spite of distressing droughts, but skin diseases prevail and appear to be aggravated by a plague of sand fleas.

The activity of the little pests may really help to prepare the field for their microscopic associates, just as a purely mechanical irritant—the dust of knife-grinder shops—prepares the way for the microbes of pulmonary consumption.

A few miles east of Melbourne a towering promontory forms the starting point of the "Australian Alps," and the highlands that skirt the east coast for more than a thousand miles. Here and there, on the plateaux of that coast-range, the high price of timber has evolved wood-cutter villages, permanent settlements more than five thousand feet above the level of the sea. Jurassic limestone predominates, but goitres have thus far failed to make their appearance. The real cause of that affliction is really still as problematic as that of the "milk sickness" that here and there modifies the Edens of our southern Alleghanies.

Those wood-cutters, withal, may have cut the tap-root of Australian prosperity. The wholesale destruction of hill forests has resulted in the disappearance of formerly perennial watercourses; droughts have been aggravated, so much so, indeed, that the last one still glares, after prevailing unremittingly for two years and six months.

The tree-devouring axe, the destroyer of thousands of eastern garden-lands, may for once have contrived to kill a continent.

THE HYGIENE OF OCCUPATIONS.

The occupations in which men and women are employed through a considerable part of their lives have a direct effect upon the health and longevity of those who are thus employed either for better or for worse. If it were possible to gather the facts in regard to the nine millions of agricultural workmen, fishermen and others employed, according to the United States census, in outdoor industries, as has been done in other countries having better systems of vital statistics than the United States, this general class of employed persons would undoubtedly be found to live longer and to lead more healthy lives than the millions of work-

men and women who are employed in indoor occupations of a less healthful character.

We have laws relating to the inspection of factories and workshops by police authorities, for the purpose of securing better conditions relative to the hours of labor and the employment of children, but very few States have enacted laws such as exist in other countries, providing protection against the injurious action of special industries upon those who are employed, and furnishing medical supervision and inspection over such establishments. The country in which the most efficient organization of this character exists in England, and the recent annual report of Dr. Whitelegge, the chief inspector of factories, shows to what extent such inspection is provided. A decided step in advance has been taken in several European countries in recent years, in the employment by the government of medical, engineering, and chemical experts to aid in investigating the different sources of danger in hazardous occupations and in devising means for the relief of operatives.

The chief dangers to health to which wage-earners are exposed are the following:* (1) Those caused by overfatigue; (2) those arising from defective conditions in workshops; (3) those arising from the work itself (dust, gases, poisons, etc.); (4) those caused by the machinery (explosions, etc.); (5) those connected with the worker (food, lodging, mode of life).

The increasing interest displayed by the public in social affairs has led to a corresponding desire for accurate information as to the condition in which their fellowmen and women live and work. The volume just issued by Dr. Thomas Oliver, entitled "Dangerous Trades," is a response to a widely expressed demand for a true and authoritative statement upon this important subject—a subject which concerns not thousands, but millions of the workmen of different countries.† The field covered by this work is a very wide one, and as no one person is competent to deal adequately with the whole subject, it was found desirable to engage the co-operation of experts on the various trades with which the volume treats. In carrying out this plan an enormous amount of information, hitherto unrecorded or inaccessible, has been brought together and made available for reference.

The work consists of sixty chapters, written by thirty-eight different authors, among whom are many physicians, health offi-

*Palmberg; Public Health and its Applications, London, 1893, p. 168.

†Dangerous Trades: The Historical, Social and Legal Aspects of Industrial Occupations as Affecting Public Health. Edited by Thomas Oliver, M. A., M. D., F. R. C. P. London, England: John Murray, Albemarle St. 1902.

cers and factory inspectors. The first nine chapters embrace the following general topics: A Historical Sketch of the Development of Legislation Relative to Dangerous Industries; The Regulation of Injurious Occupations in Different Countries; The Principles of Prospective Legislation for Dangerous Trades; Infant Mortality and Factory Labor; Child Labor; Home Work; The Physiology and Pathology of Work and Fatigue, and The Mortality of Occupations, the latter by Dr. John Tatham, of the Registrar-General's office. The remaining chapters relate to the different harmful occupations, and to the accidents, injuries, lesions and diseases to which persons employed in them are subjected.

Dr. Tatham's monograph upon "Dust-producing Occupations" shows that, in a list of twenty-two such industries, potters or earthenware makers, cutlers, filemakers, glassmakers, coppermakers, gunsmiths, iron and steel workers, zinc workers, stone quarriers, brassmakers, chimney-sweeps and lead workers, have the highest mortality from phthisis in the order named, while filemakers, lead workers and potters have the highest general mortality.

The subject of "Lead and its Compounds," by Dr. Oliver, is very fully treated, and embraces a large number of important industries, such as lead mining and smelting, the manufacture of white and red lead and other lead compounds.

"No industry, unless, perhaps, that of pottery manufacture, has caused so much plumbism as the manufacture of white lead, and yet in none has strict attention to regulations and personal hygiene been so productive of good as in these two industries." The author expresses his opinion that:

"The predisposition to lead poisoning is in both sexes doubtless spread over all periods of life, but, so far as occupation exposure to lead is concerned, my opinion is, (1) that women are more susceptible than men; (2) that while female liability is greatest between the ages of eighteen and twenty-three years, that of men is later; and (3) that while females rapidly break down in health under the influence of lead, men can work a longer time in the factory without suffering, their resistance apparently being greater. In addition to a sexual predisposition to plumbism, there is also an individual and a family tendency as well. It is difficult to explain this susceptibility of certain persons to lead poisoning. As to the fact, however, there is no doubt. It is partly a constitutional, and it may be partly a temporary and accidental condition."

A still more dangerous occupation is that of steel grinding. An examination of the returns relating to cutlery grinders shows that out of every 1,000 deaths of this class of workmen, phthisis causes 345, and other respiratory diseases 295, or collectively these diseases account for 64 per cent. of the entire mortality of men employed in this industry.

The interesting topic of phosphorus necrosis, as occurring among matchmakers, has been the subject of a recent parliamentary inquiry with reference to the following points: (1) The nature and extent of the dangers attending the use of yellow and white phosphorus; (2) the means whereby these can be lessened; (3) the practicability of discontinuing the use of yellow and white phosphorus.

Instances are cited in which thirty cases of fracture of the long bones, caused by muscular effort, occurred among the matchmakers in one town. Dr. Kocher, of Berne, treated a matchmaker who broke his thigh bone five times.

The occupation of mining is of special interest at the present time, and is fully treated by Professor Louis, and a chapter upon the air of mines by Dr. Haldane is also presented.

Some excellent German statistics are given, showing that among 3,623,175 persons insured for one year in the Miners' Relief Fund there were 278,371 accidents, or 76.8 per 1,000 of those employed, while 7,721 of these, or 2.1 per 1,000, proved fatal. The number of fatal accidents is decreasing, and that of non-fatal accidents is increasing. The greater number of accidents was due to the falling of rocks, coal and other falling bodies.

The following were the death-rates per 1,000 persons employed in Russian mines for the ten years 1891-1899: In bituminous coal mines, 2.5; in lignite mines, 1.9; in metal mines, 1.1; in other mines, 1.7. Metal mining is in Germany a much safer occupation than coal-mining. In Belgium and France the death-rate of miners is less than that of Germany.

For the United States, Hoffman, a well-known insurance statistician, gives the following figures: Death-rate from accident per 1,000 miners employed: Iron ore miners, Michigan (1892-1896), 5.1; (1899-1900), 3.6. Copper miners, Lake Superior (1892-1896), 3.6; (1898-1899), 2.1. Metal miners, Colorado, 3.9; Missouri, 2.6. In bituminous coal mines, 2.1; anthracite, 3.1.

In England the accident death-rate of miners has diminished from 4.3 per 1,000 in 1851 to 1.3 in 1899. This improvement has taken place in coal mining, but not in metal mining.

In the chapter on eye diseases in their relation to industrial occupations, the following classification is adopted: (1) Diseases due to occupations involving prolonged use or excessive strain of the eyes, such as nystagmus among miners, etc.; (2) diseases due to occupations involving the use of certain poisonous substances; (3) diseases due to occupations involving exposure to excessive light or heat or both; (4) injuries or accidents among grinders, iron and steel workers, etc.

The following additional topics show the comprehensive character of this valuable work: Rag-sorting and shoddy, jute, laundry workers; fish curing; fruit preserving; tinplate works; aerated waters; flax, linen and cotton manufacture; fur pulling; compressed air illness; boiler making; mountain climbing; iron and steel industries; occupation diseases due to excessively repeated muscular actions; and miscellaneous trades, among which are such industries as railway employment, celluloid manufacture, tobacco and cigar manufacture, dealers in alcoholic drinks, label and stamp licking, glass blowing and chimney sweeping.

Some of the foregoing industries are conducted to a much larger extent in America than in England, and yet but little has ever been accomplished here by means of State legislation, toward placing them under trained medical supervision, whereby very much might be done toward improving the conditions under which 20,000,000 of workmen are employed in different industries, and thereby preventing or at least diminishing materially the loss of life among them, which is due to clearly preventable causes.—*Boston Medical and Surgical Journal,* Sept. 25, 1902.

URALITE: NEW FIREPROOF MATERIAL.

In these days when cheap and fireproof building materials are so sought, a new material is being extensively pushed, which is, I believe, worthy of the praise it is receiving. Uralite is composed of asbestos fiber, with a proper proportion of silicate and bicarbonate of soda and a small amount of chalk. It is supplied in various finishes and colors, according to its ultimate purpose. In a soft form, the sheets are like asbestos board; harder, they resemble finely sawn stone and have a metallic ring. Uralite can be supplied in a plastic form for pipe covering if required. The principal advantage of the material is undoubtedly its fire-resisting

property. It is a non-conductor of heat and electricity, is practically waterproof (and may be made entirely so by paint), and is not affected by atmospheric influences, nor by the acids contained in smoke in large towns, which rapidly destroy galvanized iron.

Uralite has the further advantages that it can be cut by the usual carpenters' or woodworking tools; it can be painted, grained, polished, and glued together like wood; it can be veneered to form paneling for walls or partitions for ships' cabins or for railway carriages; it does not split when a nail is driven through it; it is not affected when exposed to moisture or great changes of temperature; and it can be given any desired color either in the process of manufacture or afterward. It is the invention of a Russian artillery officer and chemist, named Imschenetzky.

The process of manufacture (patented) is akin to that employed in paper making, and the same class of machinery is adopted at various stages. The process commences in what is known as a "preparation building," where the crude asbestos is first of all "teased" out and freed from sand and other foreign substances. It is carefully graded and separated and passes onto edge runners, where a small portion of whiting is added to prevent grinding rather than the loosening of the fibers which is desired. From the edge runners it is conveyed by elevators to a floor above, where it is fed into a Krupp disintegrator, which further loosens the fibres. It is again separated by air blasts and by sieving, and is then ready for the next stage.

In another building, the asbestos is mixed with an equal weight of whiting, if white uralite is being made; or if gray or red uralite is needed, this is replaced by carbon black or red oxide. The whiting is first reduced to a cream by beating it up with revolving paddles in a mixer. This is passed through a sieve for the removal of accidental impurities, and thence into a "hollander." The asbestos is next added, the usual charge being 5½ cwts., and then the coloring matter. The whole is worked up into an emulsion by revolving screws and beaters, for a quarter of an hour or so, and there is a further separation to remove any sand which may have hitherto escaped detection.

The uralite pulp then passes to a machine designed on much the same lines as that employed in making paper boards. The pulp is delivered over riffle boards onto an endless revolving blanket, and passing through a series of rolls is partially dried and compacted. It then passes onto a revolving drum at the end of the machine, on

which some fourteen or fifteen thicknesses are deposited before the required thickness is attained, this point being signalized by a flash from a red incandescent lamp above.

During the process of winding onto the drum, a solution of sodium silicate, with an amount of sodium carbonate insufficient to permit of the immediate deposition of the silica, is passed over the successive fibers of asbestos and serves as an adhesive.

The large sheets, as they are taken from the drum in their pliable state, are quickly cut to smaller ones, measuring 6 feet 2 inches by 3 feet 1 inch. These sheets are piled up, alternating with sheets of wire gauze or sheet iron, to a height of about 40 inches. The pile is then placed under an hydraulic press and the pressure slowly increased, so that at the end of half an hour it is equivalent to about 200 pounds per square inch. This is maintained for one and one-half hours, and the pile is then left to harden for twenty-four hours, after which the sheets are removed to go to the storing rooms. Here, they are placed vertically in racks on trucks, and pass through a series of stoves with graduated temperatures. The stoves are gas-fired. They are then steeped in a solution of sodium silicate, washed, left to dry, and again passed through a stove, after which they are steeped in a solution of sodium carbonate, and washed and dried as before. These subsequent operations are repeated as often as required for the final hardening of the sheets, and the entire process occupies several days. The sheets are stacked for some days and again passed through the stove, being then ready for use, though I understand that, like timber, they are the better for a little seasoning. The sheets of uralite thus produced are found to be uniform in thickness, three thirty-seconds of an inch being the standard. An expert writing on this subject says:

"Uralite, in its present form, is the result of protracted research, experiment, and tests, and I was, on the occasion of my visit to the works, enabled to witness a somewhat unique demonstration of its fire-resisting and other qualities. I understand, by the way, that tests carried out by the British Fire-prevention Committee have already thoroughly established its reputation with that important organization. In the tests carried out on the day of my visit to the works, I was given a confirmation of these results. Three principal tests were made, and they fully proved that uralite possesses the following qualities: (1) The material is able to withstand intense heat for a long time without disintegration; (2) its

non-conducting powers are uniform throughout; (3) it is capable of entirely preventing the passage of flame from any room where fire occurs; (4) after prolonged exposure to fire, it is able to resist water without serious damage; (5) exposure to changing atmospheric conditions does not affect it; and (6) all the materials employed in its manufacture possess substantially the same chemical, physical, and thermal constants. It is claimed that no other material fulfills all of these conditions.

"In order to carry out the tests, a small brick-built house, an iron-framed hut, lined and covered with uralite, and a duplicate platform were erected. Each of these was fitted with pyrometers, recording the temperatures electrically, and was filled with highly inflammable materials. In the case of the platforms, the materials were distributed evenly under the two sections. To the test house were fixed four doors. One door was constructed with two oak boards three-fourths of an inch thick. Next to the timber was a thin steel armor plate, and over all was a covering of uralite. The second door, suitable for inside use, was built of two sheets of hard uralite running through the centre of the door and forming panels. The framework consisted of timber laid on either side. A door for warehouse purposes consisted of a thickness of soft uralite in the centre, and oak on either side. Next to the timber was fixed a thickness of soft uralite, and the whole was covered by a layer of hard uralite. The stiles of the other door were constructed of oak, 1½ inch thick, and the panels were filled in with uralite cement. The timber was covered all over with soft uralite, and on that a thin steel armor plate was fixed. The whole was covered by hard uralite. In each case, the materials were fixed together by means of nails and screws. A fire was lighted inside the house and the doors were shut. The highest temperature reached was 2,350° F. After the test, it was found that in each case the doors had resisted the fire. It is interesting to note, however, that in the case of the second door practically all the wood outside was burned off, leaving the outer layer of uralite uninjured by the severe heat. The fire was left to burn for over an hour. In the hut was placed a deed-box made of the uralite and wood, and in the box were placed some papers, a book, a crucible containing paraffine wax, and another holding a piece of easily fusible metal. After being subjected to an external heat of 2,030° F., the papers and book were not affected in the slightest degree. It was found that the wood nearest the fire was charred

right through, but the middle layer of uralite was sound and the paraffine wax had only melted slightly. The platform, 12 feet long and 6 feet wide, was built of wood, and but one-half was covered with uralite. After the fire had burned underneath it, and had reached 2,270° F., the unprotected portion was completely destroyed, but that covered with uralite was whole and strong and several of the visitors walked across it. After the fire in the small house had been going three-quarters of an hour, and when the pyrometer was registering 2,120° F., those present were able to place their hands in contact with any part of the door which was covered inside and out with uralite, though by this time the whole of the woodwork had been burned off the door which had uralite for its panels only. Temperatures were recorded at intervals throughout the tests, and detailed results, which I need not give here, can be had from the British Uralite Company on application by those interested.

"In the well-equipped laboratory, I had an opportunity of witnessing some equally interesting tests. One of the staff took a strip of uralite about 1 foot in length and 1½ inches wide, of the standard thickness, and alternately stirred up a bowl of boiling water and a freezing mixture. In the latter, about an ounce of mercury was suspended in a test tube, and this rapidly froze into a bright bullet in the bottom of the tube. Some pieces of india rubber tubing placed in the mixture were broken with the hammer-like cast iron. The strip of uralite, on the other hand, showed no sign of warping, lamination, or disintegration; in fact, it would have needed an expert to have told subsequently which end of it had been subjected to such severe changes of temperature. In subsequent experiments with acids, the uralite came out equally well.

"I afterward witnessed some tests showing the crushing and breaking strain of the material. In the first, a cube 1 inch square, built up with sections, cut from standard sheets, was subjected to hydraulic pressure. A pressure of 19.8 tons was registered before they gave way. In the second test, a strip 9¼ inches long, 1½ inches broad, and seven sixty-fourths of an inch thick was placed betwen supports and gradually subjected to an increasing weight placed at its centre. It did not break till a weight of 6.875 kilograms (just over 15 pounds) had been applied."

It will be apparent from the above that the uses to which uralite can be put commercially are many. It will probably find its widest field of service in the building trades, and it appears that it should

prove equally valuable whether the buildings are of a temporary or permanent character. Owing to its extreme non-conductivity, huts, railway carriages, barracks, hospitals, etc., constructed with it, while absolutely fire and water proof, are warm in winter and cool in summer. A room covered (walls, doors, ceiling, and floor) with uralite three thirty-seconds of an inch thick might have its contents burned, it is claimed, without any danger of the fire spreading. Another great advantage is that immediately after the work is finished, the room can be occupied, no time being required for drying, as in the case of plaster.

The fire-preventive qualities make the material invaluable for warehouses, particularly when these are filled with inflammable materials, since, with uralite partitions, a fire can be confined to the one compartment in which it originated. For partitions, light wooden framework only is required, with sheets of uralite fixed on both sides, or it can be affixed to match boarding.

Uralite should also prove valuable for use in ships, since, being unaffected by damp, it will not warp or crack, and, in the case of iron passenger ships (which retain for a considerable time the temperatures to which they have been subjected, with consequent discomfort to the passengers), the advantage of a lining of uralite is self-evident. An important use should be found for uralite as a lining for walls and partitions in hospitals, asylums, workhouses, etc., as it will stand fire purification, and the room can thus be very readily disinfected. The same will apply to huts or barracks in mining camps and settlements, which now have to be frequently destroyed on account of disease or vermin.

The new material is particularly suitable for brewery stores, malt bins, etc., and also for cold storage of meat and of other perishable articles. A light studding with sheets of uralite on both sides, and the intervening space filled with silicate cotton or other convenient packing material, forms a most complete and inexpensive insulator. The material, I am informed, makes a successful joint for steam piping, and is certainly preferable to wood for boiler lagging.

Uralite is, I understand, being put upon the market at a reasonable price, when its many advantages are taken into consideration. It should be added that, the weight being only about one-fifth that of iron, it will cover a far greater area than a corresponding weight of corrugated iron.

As has been stated, the material is patented. All foreign pat-

ents, except that for Russia, are held by the British Uralite Company, of 50 Cannon street, London, E. C.

OLIVER J. D. HUGHES, *Consul-General.*

COBURG, September 10, 1902.

WIRE-GLASS WINDOWS.*

From the "American Architect," Sept. 27, 1902.

The subject for which I shall have the honor of asking your consideration will be Wire-glass—the fire-retardant, a building material which tends to reduce to the minimum the hazard of conflagration and conduces to the elimination of some risks attending the lives of us humble fire-fighters. The range of possibilities in fire-protection is too wide to speak of here, if I am to be favored with your attention, and only a small portion of it can be engaged in during this short session. I shall endeavor to advance that which I believe to be the most important factor in the protection of buildings against conflagration, and I shall be amply rewarded if I enkindle in your minds an inclination to seek more information upon the subject than I am enabled to communicate.

It is manifest to all thoughtful minds that the phenomenal development of the real-estate values in our cities has made the tall building a necessity, and this necessity has brought with it the need of adopting in building-construction barriers to conflagration, and there are to-day buildings capable of enduring without structural injury the action of fierce, long-continued interior and exterior flames and the application of cold water upon their heated surfaces. Structurally, a building of this class is admirable—the foundations are secure, the walls and roof fireproof, but openings in walls and roof are necessary to render it habitable. Obviously the vulnerable parts of a building are the openings in the walls and roof—its doors, windows and skylights. To these openings the

*A paper, by Edward F. Croker, Chief of Fire Department, City of New York, read at the Thirtieth Annual Convention of the International Association of Fire Engineers, held in Grand Central Palace, New York, September 16, 17, 18, 19, 1902.

spread of flame is almost wholly attributable. This has been the history of so many destructive conflagrations that experts have long agreed that no structure in a closely built city can be considered even approximately secure against fire so long as it is provided with only ordinary windows, skylights and doors. My experience and observation have been such as justify this opinion, and I have most strenuously maintained that the quantity of wood contained in what I have termed "a structurally fireproof building," taking into consideration, also, the furniture and fittings, would, in the event of fire, endanger the property and the lives contained within it.

Shutters of iron, or of metal-covered wood, may protect windows if they are carefully closed, but in practice such shutters fall short of the purpose for which they were intended. When the crisis comes the shutter is frequently found open. Under the most favorable conditions an iron shutter at a fire is not the thing that the firemen want to come in contact with. Its rusty fastenings and blistering sides are objectionable, to say the least, and its reach, when it swings open, is liable to knock a man off the ladder. This is a risk to which the fire-fighter should not be subjected. There is no braver, manlier, or more faithful set of men in the public service or out of it than the brave lads enrolled in our Fire Departments. I know of whom I speak and I am well acquainted with the chances they take. They are ready to fight with death every day. Every year sees them saving life heroically or dying in their duty. Their work is as trying, difficult and dangerous as there is in the world. Yet they are not safeguarded. I know what ready fellows they are and I feel that all known means of protection should be adopted to render their calling less hazardous.

Wire-glass is, in my opinion, the fire-stop for window and skylight openings—wire-glass set in metal frames. It supplies the requisite light and ventilation as well as protection against fire; its installation obviates the necessity of the cumbersome and unsightly hinged shutters and the projecting lugs and adjustors which support and secure them. It affords protection regardless of the janitor's neglect, because the thought of fire is not necessarily present in the mind of the tenant to induce him to close the window-sash, and when closed it prevents the ingress, egress or communication of flame. It enables the fire-chief to size the situation and direct his men intelligently. The location and volume of the blaze are immediately disclosed, and if the conditions war-

rant it, the firemen can effect an opening for the stream with his fire-axe.

Hard conditions, great risks and the sacrifice of large property and many lives are preliminary to the establishment of standards, and by such means wire-glass has come to be recognized as standard, and the degree of honor which is its legitimate due should be generally recognized.

Succinctly stated, wire-glass has yielded two fixed values as its contribution to fireproof building construction:

It retards fire without hiding it—permits the blaze to declare itself.

It can be cracked, but it cannot be scattered. If fractured it retains its place.

Now, we have to remember what we can't forget, and we are mindful, therefore, of experiences which enable us to fully appreciate the value first stated. Of the many embarrassments to which the fire-fighter is subject, that which prevents fire from disclosing its location in its incipient stage is the most serious. Within the congested districts of our great cities, our organizations are such as enable us to reach the scene of action and have our nozzles in hand within two or three minutes of the alarm, and if we could immediately get at the fire, we would, in most cases, have little difficulty in confining the blaze within the limits of the apartment in which it originated.

Modern science has equipped our departments with devices necessary to combat fire, the most contagious, virulent and disastrous of all perils to which buildings are subjected; and modern science has devised the means by which fire can be confined within the walls of buildings without rendering the same inaccessible to us, but the adoption of the means available is not general, and upon arriving at a fire we are frequently confronted with tin-covered and iron-clad shutters which obstruct our vision and our efforts to locate and conquer a blaze which becomes a conflagration because of the precious moments lost in concentrating our energies upon the seat of trouble.

This condition has long been a serious menace in all cities and it is now intolerable, because the installation of wire-glass presents no technical difficulties. It is of acknowledged efficiency and no less economical than effective. It has withstood the severest tests and its cost is well within the means of all building owners. The insurance companies give "preferred" rates when it is installed,

and thus practically invest in it. Their scheme is to reduce hazards, and in the belief that wire-glass effectually accomplishes this, they induce its adoption by substantial indorsement. Its ability to abate horrors and loss which attend conflagrations in cities is ample justification of the reasonable laws providing for its adoption, and an exigent public duty is presented to building inspectors to prevent these laws being nullified by official inertia.

There is a region paved with good intentions, and many easy-going owners of buildings contribute to this paving-fund by deferring the adoption of known means of protection, and at the same time create occasion for regret from heavy financial loss and probable loss of life. I want to see the obligation placed upon owners of buildings to prevent such losses by the means which will effectually render fire non-communicative, and I think I have specified the means. The significance and overwhelming argument in favor of wire-glass as a fire-stop is the fact that when fractured it retains its place and continues to retard draught and its attending flames.

Doubtless, many of the chiefs present have had occasion to recognize the efficiency of wire-glass as a fire-stop, and, of the many, Chief Musham's experience is especially worthy of reference. The fire which destroyed the Armour Lard Refinery, Union Stock Yards, Chicago, on the night of May 16, threatened for a time the entire district. Chief Musham was present, and he has stated that the wire-glass in the windows of the several walls prevented any communication through them and demonstrated the ability of wire-glass to prevent the spread of flame. The building destroyed was of recent construction, 100′ x400′, five stories in height, and subdivided into four sections by fire-walls, two of which were completely destroyed.

The quantity and nature of the material in combustion—refined lard—resulted in the hottest kind of a fire, and its intensity and duration are hardly comprehensible. The Chief tells me that the flames reached to a height of 150 feet above the roof and the combustion was so perfect that scarcely any sparks were observed.

I am quoting Chief Musham because I think, perhaps, his observation of wire-glass in this instance was under a better condition than can be conceived for an actual service-test of wire-glass. The entire interior of the building was of inflammable construction, made more so by being saturated with lard, and its five great floors were loaded with tons of this highly combustible

product. Tanks containing thousands of gallons of rendering were exploded and their contents dashed against the walls and windows, and the intensity of the heat was so great that the walls holding the frames and sash which accommodated the glass crumbled, but until they fell the wire-glass retained its place.

This fire establishes conclusive proof of the efficiency of wire-glass as a fire-retardant and its staying qualities, and for the purpose of illustrating my subject I have considered it preferable to my own experience.

[But wire-glass is not subjected to a fire-test every day, and except when fire is present it has undesirable, even dangerous, qualities. When the Engineering Experiment Station has time to study wire-glass, it will find in the many acres of this material at the South Terminal Station in Boston ample food for study and reflection. In the windows that face east, south and west, and in the thousands of feet of pent-roof over the street sidewalks, there is hardly a sheet of the glass that is not cracked and shivered into a dozen or a hundred different pieces of glass, just now held in place by the imbedded wire and the unequal planes of fracture of the glass itself. But where cracks are, there moisture and acid-gases can penetrate, and when corrosion has done its work on the wire there is likely to be many a repetition, less innocent, too, of the incident which attended President Roosevelt's reception in this city a few weeks ago, when, as the newspapers reported, a sizable piece of this shattered wire-glass fell onto the platform not far from the President. Meanwhile, before the time comes when falls of heavy pieces may be looked for, much of this shattering of the glass is already accompanied by the flying of fine splinters of glass, and as the oculists of Boston are said to have recognized a class of injury that they call "elevated-railway eye," it is not impossible that they have been called on to treat for wire-glass eyes travelers who have to use the Boston Terminal Station. As fracture occurs least often on the north side and most frequently where the windows face the rising sun, it is evident that the manufacturers must give further study to the qualities of radiant heat before wire-glass can be held to be a perfectly safe material to use.—EDS.]

STREET-CLEANING APPARATUS AT DUSSELDORF EXPOSITION.

Mr. E. A. Creevey, U. S. Consul at Glauchau, reports (Sept. 5, 1902): One of the most interesting features of the Düsseldorf Exposition is the department for public health, in which a new street-sweeping apparatus, manufactured by the Salus Strassenkehrmaschinen Gesellschaft, of Düsseldorf, attracts special attention. This apparatus might be termed a combination street washing and sweeping machine and a mud dredger. The cylindrical brush draws the mud to the middle, instead of throwing it off to one side, and it is carried up through an inclosed chute by an endless chain of small buckets and dropped into a cart attached to the rear of the machine. Some interesting and minute tests have been made with the Salus sweeper, and the following report, taken from a German newspaper, will be of interest to American cities interested in the matter of clean streets:

It appears from the reports that, without throwing up the least dust, the machine cleared the road as well as if it had been done by hand; droppings, grit, stones the size of a child's fist—nay, entire bricks—were dealt with indiscriminately by the broom. In the opinion of city engineers and others, this apparatus meets every requirement of such a mechanical street sweeper. The only drawback appears to be its high initial cost—nearly 6,000 marks ($1,428)—but this would indeed be a poor objection to its introduction, if the whole sum is recovered in the course of a year, as the manufacturers claim for their machine. We understand, moreover, that this price is subject to a material reduction as soon as a demand is created; and for this, it may be hoped, we shall not have to wait too long. A German contemporary ("Technisches Gemeindeblatt," Berlin) has calculated that in case of an average scavenging district, ordinarily served by two horses and a night shift of twenty scavengers, the Salus would effect an annual saving of 9,000 marks ($2,142) in wages, the staff being reduced to one-half. Against this must be set the price of the machine and the increased cost of maintenance, as compared with horse brooms. It is not likely, however, that the latter will swallow the balance of the saving, so that even in the first year after adoption

a clear profit can be made, in addition to securing greatly improved sanitation.

There can be little or no doubt that it is superior to the ordinary practice of sweeping by horse brooms, whether for efficiency or economy. It would indeed be a very poor contrivance if it did not surpass the commonplace machine broom, the excuse for which was its cheapness. One of the superior features of the Salus is the easily detachable dust cart, without which, of course, the apparatus would be a cumbrous device. If we are not mistaken, the ingenious sliding platform, with the attached scraper, forms another feature of novelty. Antwerp, Cologne, Essen, and several other towns in Germany are using the machine, and it was awarded the golden medal of the Prussian Ministry for Home Affairs at Berlin last year.

TAR OR OIL FOR LAYING DUST.

The continental press has given considerable notice to experiments made by Dr. Guglielminetti, of Monte Carlo, for laying dust by means of oiling or tarring the roads. One paper says:

The experiments in oiling or tarring the roads at Champigny were very successful. The apparatus in use were perfected by M. Audouin, engineer-in-chief of the chemical department of the Compagnie Parisienne du Gaz. Two successive processes of using tar were employed.

(1) Distribution by means of a special type of sprinkler, fitted with a fan-shaped nozzle, pierced with two rows of orifices.

(2) Distribution by means of a tank of about 200 quarts capacity, heated by a traveling furnace, and operated in the same manner as an ordinary sprinkling tank.

It is shown that the road, macadamized and well rounded, should be thoroughly washed and brushed on the day before the tarring operation, and to the extent of laying bare the macadam. After all trace of humidity has disappeared, the hot tar should be spread upon the road in a thin layer.

In the trials at Champigny, when the tar commenced to cool, fine sand was scattered over the section treated. Orders were then given that the road should be closed to traffic for a few days, and it is assumed that in a few months the value of the experiments will be demonstrated.

A similar trial, conducted six weeks ago at Geneva, has given excellent results. The delegates of the "Ligue Internationale des Associations Touristes" held at Geneva, reported on August 16 that the tarred surface was not slippery, that it was extremely hard, and that the horses' hoofs left no visible trace.

During the six weeks that have elapsed, no softening of the layer has been observed in spite of the very hot weather. The frequent rain storms have done no damage. The water washed the surface without making it slippery, and it ran off rapidly, not being able to soak into the road.

The cost of the tar, reckoned at 50 francs ($9.65) a ton, came to about a cent for each square yard.

It is evident that a road protected from humidity and inclemency by this impermeable layer will last much longer than if left in its natural state, so that the lubrication process presents economic as well as hygienic advantages.

The "Touring Club de France," the "Automobile Club de France," and the "Association Générale Automobile" are disposed to encourage these experiments.

HENRY H. MORGAN, *Consul.*

LUCERNE, September 4, 1902.

SEPTIC TANK SEWAGE SYSTEM IN VANCOUVER.

U. S. Consul L. E. Dudley reports (Oct. 2, 1902) that about two years ago the city of Vancouver adopted the septic-tank system for the disposal of its sewage. There are three tanks, located at different points in the city. One of these disposes of the sewage of a district having a population of 5,000 people.

The tanks are covered, as the bacteria work in the dark. On a recent visit, I found a scum between two and three inches thick over the surface of the tank; this scum, I was informed, is composed of the little microscopic insects which consume all the solid matter. The tanks had been in full operation for about eighteen months, only clear water had been discharged, and yet there was but a small layer, less than one-half of an inch thick, of ash remaining at the bottom of the tanks.

The officers of several municipalities in the near-by States have examined this system and found it so satisfactory that, I am informed, they will recommend the introduction of the septic tanks in their cities. The system is in use at Urbana, Ill.

I shall be glad to procure further information for any one who may be interested in adopting this system.

THE INFLUENCE OF THE DISCOVERY OF THE RELATION OF BACTERIA TO DISEASE ON THE PRACTICE OF MEDICINE EXCLUSIVE OF SURGERY.

AWARDED THE SCHUYLER ALUMNI PRIZE FOR 1901.*

By H. JUDSON LIPES, M.D., Lecturer on Obstetrics, Albany Medical College; Obstetrician to the Albany Guild for the Care of the Sick Poor.

Bacteriology as a science is of comparatively recent development, although the foundation of the study of vegetable and other micro-organisms was laid over two centuries ago.

The organisms known as *bacteria* were first regarded as highly complicated "infusion-animals" (Ehrenberg, 1838), while later they came to be looked upon as quite simple vegetable organisms, consisting merely of protoplasm and of a membrane. While the bacterial cells are certainly not the simplest form of cell that may be conceived to exist, they are members of the lowest group of the plant kingdom. They arouse special interest by the fact that bacteria are those organisms which research has brought into relation with the questions of spontaneous generation, fermentation and decay, and the origin of disease. It was the consideration of the most important questions of biology and pathology, of science and medicine, that first directed attention toward bacteria.

In the early study of bacterial forms certain kinds with marked characteristics were found in connection with various specific diseases and specific decompositions.

Relation of the Study of Bacteriology to Medicine.

The germ theory of disease is the revolutionizing factor in medicine. Therapeutics has been changed by its discovery from an empirical to a logical method of cure. Marvelous possibilities in surgery have been opened up as the result, and, best of all, it has explained to us the methods of disease transmission, revolutionizing our ideas of hygiene, sanitation and preventive medicine.

*From Albany "Medical Annals," June, 1902.

From the earliest times the history of bacteriology has been intimately associated with that of medicine. Indeed, it is only through the investigations into the life-history of micro-organisms in their relation to disease that our present knowledge of the etiology, course, and prevention of the infectious diseases has been acquired; and it is only by the practical application of the principles and methods of bacteriology that many diseases can be positively diagnosed or the problems which present themselves to the sanitarian be certainly solved. The prominent position which bacteriology already holds toward medicine is, moreover, daily increasing in importance. Original discoveries are constantly being added to the list of known germ diseases, and the outlook is favorable for eventually obtaining through serums, or through the toxic substances of the micro-organisms themselves, means for immunizing against, if not curing, many of the specific infections. Even at present, bacterial products and protective serums are used successfully as preventatives in many of the infectious diseases and as a cure in several. An acquaintance, therefore, with the main facts and results of bacteriology is as necessary to the education of the modern physician as a knowledge of anatomy, pathology, chemistry or any of the allied sciences.

But before entering into a detailed consideration of the subject, it may be interesting and instructive to review briefly the most important steps which led up to the development of the science, and upon which its foundation rests, in which we shall see that the vast results obtained by bacteriology were gained only through long and laborious research and after many obstacles were met and overcome by indomitable perseverance and accurate observation and experiment.

Origin of Bacteria.—The query is often raised by the laity as to whether the present scourge of mankind—bacteria—existed prior to present times. If we are to consider the nebular hypothesis of the origin of the solar system we may believe that the first living things existing upon our earth must have been able to subsist under conditions greatly differing from those which are present to-day. The atmosphere of earlier times must have contained less oxygen, while less light but greater heat prevailed. We now recognize certain forms of bacteria which are able to exist without oxygen, without light, and at a considerable degree of heat. Other than these microscopical bodies there are no organisms which can exist under similar conditions, and we are therefore led to believe that bacteria existed before higher forms developed, and,

according to laws of evolution, they may have had much to do with the development of higher forms.

The idea that flies, mosquitoes, and even quite invisible bodies, were the cause of disease is not new and can be traced back to very ancient times. The first conception of this subject known to us was manifested in the establishment of the Prince of Devils—Beelzebub—the deity, as the name implies, of visible or invisible poisonous flies that brought disease.

Marsh fever was supposed in earlier times (and the idea is still prevalent in the minds of many) to be due to emanations or injurious gaseous substances derived from lowlands and swamps.

The theory of the cause of disease was perhaps first proclaimed by the Roman writer, Varro, who said that, "as we recognize with the naked eye both large and small insects hovering over marshes, so insects still smaller are able to exist, and these forms, so small as to be invisible, might perhaps be the cause of marsh fever."

Paracelsus also had a dim foreshadowing of the truth when he spoke of the "seeds of disease." For many years this embryonic theory was lost and did not appear again until the latter part of the seventeenth century.

History of Bacteriology.

The first authentic observation of living microscopical organisms, of which there is any record, are those of the Jesuit Athanasius Kircher, in 1671. With a simple lens he discovered "minute living worms" by his investigations of the process of putrefaction of meat, milk, vinegar, etc., and although he gave no description of their form or character, he was subsequently the first to develop in a more comprehensive fashion the theory of a *contagium animatum.*

In the latter part of the seventeenth century (September, 1675) Van Leeuwenhoeck, a Hollander, known as the father of Micrography, was the first really to discover the "world of the infinitely little." He was a polisher of lenses, and by the arrangement of several simple lenses he was able to discover living motile organisms in rain water, intestinal secretions of animals, etc. He showed a picture before the Royal Society of undoubted bacteria and observed and described the motility of organisms, saw cocci and probably spirilla. He termed them *infusion animals.* No conclusions were drawn, however, as to the status of these organ-

isms in nature, but he observed that we drink bacteria in water, which, although small, cannot penetrate into the blood.

Van Leeuwenhoeck's successors described and classified these "infusion animals" and his discovery was quickly made known and used as the explanation for many diseases.

From the earliest investigations into the life-history and properties of bacteria these micro-organisms have been thought to play an important part in the causation of infectious diseases. The doctrine of *contagium animatum* was based upon the discoveries of Kircher and Van Leeuwenhoeck, and the "animalculæ", then observed in organic materials were believed to be the cause of the great epidemics of the day, such as the plague. Shortly after these first investigations, Lange and Hauptman advanced the opinion that puerperal fever, measles, smallpox, typhus, pleurisy, epilepsy, gout and many other diseases were due to animal contagion, and Nicholas Audry and Linné thought that smallpox and venereal disease were caused by these organisms, and that Audry cured himself of the latter disease by killing the worms with mercury.

In 1718 Lancise assumed the same cause for malaria. In fact, so widespread became the belief in a causal relation of these minute organisms to disease that it soon amounted to a veritable craze, and all forms and kinds of diseases were said to be produced in this way, upon no other foundation than that these organisms had been found in the mouth and intestinal contents of men and animals, and in water.

Nearly a century elapsed before the subject was again considered and before any attempt was made to define the character of these minute organisms and to classify them. The first to make such an effort was Otto Friedrich Müller, of Copenhagen, who applied many of the names we still use, and he established, as well, genera which are still recognized. He called these microscopic organisms *Infusoria* instead of vegetable forms, and thus made the mistake which aroused considerable debate and misunderstanding, since the *infusoria* are unicellular animal organisms.

During the eighteenth century *the question of spontaneous generation of bacteria* arose. The theory of the spontaneous generation of insects had been previously overthrown by Swammerdam (in 1669), and the whole subject was gone over again in relation to the more minute bodies—the bacteria. The conclusions of

Needham, who experimented on the spontaneous generation of "infusion animals," met with general acceptance until Spallanzani (1769), the greatest experimenter of his age, overthrew his claim so completely that Appert (1809) was able to devise a successful method for the preservation of food materials on the basis of their work. This was the first practical result of the older bacteriology.

New opponents continued to arise until Franz Schulze (1836), Schwann (1837), Schröder and Von Dusch (1854-1861), Van der Broek (1857), and Pasteur (from 1857 onward), overthrew by conclusive evidence every argument for spontaneous generation and demonstrated that all microbes arise by legitimate descent out of germs of the same kind. Harvey's law, *Omne vivum ex ovo,* was therefore fully established. Perty was the first to show that the bacteria belong to the vegetable and not to the animal kingdom. The fundamental work of Ferdinand Cohn gave the idea a further blow.

The principal advance in the first half of the nineteenth century was the demonstration of the fact that the bacteria stood in a certain relation to the most highly organized beings, especially to man. Stimulated by the establishment of the fact that fermentation and putrefaction were due to the action of living organisms reproduced from similar pre-existing forms, the study of the causal relation of these micro-organisms to disease was taken up with renewed vigor. Reference has already been made to the opinions and hypotheses of the earlier observers as to the microbic origin of infectious diseases. The first positive grounds, however, for this doctrine, founded upon actual experiment, were the investigations into the cause of certain diseases in insects and plants. Thus Bassi, in 1837, demonstrated that a fatal infectious malady of the silk-worm—*muscardine*—was due to a parasitic micro-organism. Pasteur later devoted several years' study to an exhaustive investigation into the same subject; and in like manner Tulasne, in 1864, and Kühne, in 1855, showed that certain specific affections in grains and vegetables, *e. g.* in the potato, were due to the invasion of parasites.

Very soon after this it was demonstrated that micro-organisms were the cause of certain infectious diseases in man and the higher animals.

Bacteriological research has always been of special interest to physicians. Many of the most distinguished physicians of the day, in the earlier history of the science, concerned themselves in

these investigations, and the progress made during the last ten to twenty years has been largely due to their work.

Discovery of Anthrax Bacillus.—Davaine, a famous French physician, has the honor of having first demonstrated the causal relation of a micro-organism to a specific infectious disease in man and animals. The anthrax bacillus was discovered in the blood of animals, dying from this disease, by Pollender, in 1849, and by Davaine in 1850; but it was not until 1863 that the last-named observer demonstrated by inoculation experiments that the bacillus was the cause of anthrax. These experiments were subsequently confirmed by Pasteur, Koch and others.

Koch advanced this line of work in a remarkable degree by the methods he devised about 1880. One of the greatest services that he has rendered to bacteriology, is his invention of methods of pure culture on solid media by means of which such isolated colonies, originating from a single germ, can be cultivated at will and obtained free from any admixture with germs of any other kinds. The isolation of pure cultures of a large number of micro-parasites was achieved and in many cases it was demonstrated by successful transfer to animals that the microbes had great significance in the origination of those diseases in which they were observed. In this series of investigations, Koch's discovery in 1882 of the germs of tuberculosis stands out conspicuously as especially epochal.

Prior to Koch's discovery, many original investigators were busy in other directions. Obermeier, in 1873, discovered the spirochæte of relapsing fever. Von Recklinghausen, Waldeyer, Klebs and Weigert had already found bacteria in the tissues in various diseases when Koch in 1878 published his investigations upon wound infections. According to his conclusions, every special disease had corresponding to it a special disease germ just as there appeared to be a special germ for each fermentation. Pasteur's comprehensive work had built the foundation for the conception that each special fermentation and disease was causally dependent upon a special micro-organism. The brilliant results which Lord Lister obtained, in 1863-1870, in the antiseptic treatment of wounds, to prevent or inhibit the action of infective organisms, exerted a powerful influence on the doctrine of bacterial infections, causing it to be recognized far and wide and gradually lessening the number of its opponents.

Neisser, in 1879, discovered the "gonococcus" in gonorrhœal discharges. In 1880, Eberth and Koch independently observed

the typhoid bacillus, but it was not until 1884 that Gaffky published his important researches, and proved the etiological relation of this bacillus to typhoid fever.

Sternberg and Pasteur independently observed (1880) a pathogenic micrococcus in saliva, which was subsequently proved by Fränkel and others (1885) to be the organism most commonly associated with acute croupous pneumonia and now recognized as the usual cause of that disease.

The year 1882, made memorable by Koch's discovery of the tubercle bacillus, will also be remembered as the year when Pasteur published his investigations upon "rouget" or hog erysipelas. In this year, also, his first communication upon rabies appeared. In 1882, also, Loeffler and Schütz discovered the bacillus of glanders.

In 1884, Koch discovered the cholera spirillum, and Loeffler the diphtheria bacillus, though it had been observed by Klebs the year before. The tetanus bacillus was also discovered in 1884 by Nicolaier, although it was not until 1889 that it was obtained in pure culture by Kitasato.

In 1892, Pfeiffer and Canon independently discovered a bacillus which is believed to be the specific cause of influenza.

These include some of the most important pathogenic bacteria, the discovery of which is of special interest to us, although under the subject of Etiology we shall refer more particularly to them as well as others.

Like all branches of theoretical and practical medicine, bacteriology owes much of its early advancement to the leaders of the Prussian Army Medical Department. The Prussian surgeon Struck, as head of the Imperial Board of Health in Berlin, took the initiative in creating the first standard working laboratory which served as a model for all subsequent institutions. Without this powerful aid Koch could not have developed his pioneer methods. Earlier pupils of the Army Medical School, like Helmholtz, Virchow, Reichert, Leyden, Fisher, and Nothnagle, had already achieved important professional positions; and upon the establishment of hygienic and bacteriological laboratories and the creation of professorships, German army physicians, and chiefly, indeed, those who were pupils of this institute, appeared as workers of the first rank. Among these we may name Behring, Buchner, Fischer, Gärtner, Gaffky, Loeffler, R. Pfeiffer, and Schrötter.

In order to appreciate the vast difference between the present existing methods of diagnosis and treatment and those which were

in vogue prior to the discovery of the bacteriologists, let us go back to the early part of the century just passed.

In the Fourth Volume of the "Medical Repository" is printed a paper of special interest to us, entitled "The Improvements, Progress and State of Medicine in the Eighteenth Century." This paper was read before the Medical Society of South Carolina on the first day of the nineteenth century. No doubt the writer made as much of his subject as possible, and the list of the discoveries and developments of the hundred years then just passed was as follows: Improvements in anatomy in the preparation of specimens; new operations in surgery; instruction of the deaf; experiments with poison on living animals; establishment of humane societies; cool regimen in fevers and smallpox; establishment of medical societies, hospitals and infirmaries; improvement and simplification of the materia medica; discoveries in chemistry; triumph of physic over smallpox by inoculation and over scurvy by vegetable diet and oxygen; and the abatement of plague and pestilential fevers. At that time these were considered wonderful advances, but appear to us, no doubt, as will a description of the advances made during the nineteenth century to an observer a hundred years hence.

Treatment of Disease in the Early Part of the Nineteenth Century.—In the early part of the nineteenth century the recognized methods of treatment were blood-letting, blisters, cathartics, and emetics, without any reference to the diseased condition, and it was heresy to advocate any other methods. People who fell victims to disease died, often because of the heroic measures employed to counteract the maladies which afflicted them. Indeed, many physicians began to feel that more patients would recover if nature were left, unaided, to fight the disease. Few, however, had the temerity to voice these sentiments, and the few that did suffered ostracism because of their expressed views. In England Sir John Forbes incurred the displeasure and contempt of his fellow-practitioners by expressing his belief that no treatment at all was better than the treatment then in vogue. This was the condition of affairs in the early part of the nineteenth century, and it is little wonder that when Hahnemann began to teach his doctrines he soon found many followers.

Domination of Systems of Medicine.—At the beginning of the nineteenth century, the so-called systems dominated the practice of medicine, for every prominent man considered it incumbent upon prominence in their profession to promulgate a complete

personal theory of medicine, to which all facts, if necessary, must be clipped or stretched to fit. Boerhaave considered that disease was due to the laxity or rigidity of the solids and the acidity or alkalinity of the fluids of the body, as the most important of all. Hoffman made diseases dependent upon the motions and moving powers of the animal economy. Rosari was the author of a system by which patients were treated with enormous doses of powerful and poisonous drugs, and cases were related at length of persons with slight illness slowly dying, poisoned by aconite, tartar emetic and digitalis. To this and the unmentionable "system of isopathy," homœopathy was to some extent a reaction.

Medical Periodicals of 1800.—An examination of the medical periodicals of one hundred years ago is of greater assistance in showing what the physician of that time was interested in, than a similar examination of the more formal medical treatise. The latter was more under the influence of the moribund theories of medicine.

There seemed to be a tendency to the publication of papers describing epidemics in comparatively remote countries, such as the West Indies, numerous articles on chemistry, of varying degrees of absurdity, *e. g.*, a paper proving that water could be entirely converted into air by repeated freezing. Another long paper on observations on the "Influence of the Moon on Climate and the Animal Economy"; with a proper method of treatment of diseases when under the power of that luminary. An abstract of a paper on "Sick Headach" was read before the Hartford County (Conn.) Society in September, 1797 ("Medical Repository," 1798), by Dr. Nathaniel Dwight. His treatment was "half a pint of hard cider drank on an empty stomach in the morning." Some one has wittingly said: "We must conclude that if the 'headach' sees fit to appear after dinner it must wait 'till the next day for treatment.'"

Death of Washington.—The illness and death of Washington, occurring so near the close of the eighteenth century, caused by an acute disease, demanding energetic and intelligent treatment, as well as the great prominence of the patient, naturally attracts attention, as the management of his case affords an example of the most approved treatment of that day, and shows, in one instance, the great benefit derived from bacteriological researches to-day. From the popular record of his illness in Irving's Life, it would appear that he died from laryngeal diphtheria after an

illness of about one day, and that the principal treatment was large and repeated blood-letting and external applications, and that the symptoms steadily increased until death. A consultant proposed tracheotomy, but it was rejected—instead the lancet was once more resorted to.

Several hours before his decease, after repeated efforts to be understood, he succeeded in expressing a desire that he might be permitted to die without interruption.

The treatment, therefore, of an old man, sick with a disease very exhausting to vitality, and so severe that the illness lasted but twenty-four hours, consisted in the abstraction of between two and three quarts of blood, the administration of about twenty grains of calomel and seven grains of tartar emetic, an injection, with external application of a blister—and "he pressed his hand in silence, retired from the bedside, and sat by the fire absorbed in grief," to quote from the attending physician, Dr. Craik.

If we note the contrast between the fanciful and changeable theories of medicine in 1800, and the well-grounded and stable theories of to-day; the practically non-existent physiology of 1800, and the physiology of to-day; the surgery of 1800, with anæsthesia and antisepsis and surgery of to-day; the therapeutics of 1800, with the domination of the lancet, prostrating emetics and cathartics, and modern treatment; the guesswork diagnosis of 1800 and the scientific investigations of the functions of the body with instruments of precision, and of its organs by many well-adapted means to-day, including the vast advances made in diagnosis through the studies of the bacteriologist; the wild theories of etiology prevalent in 1800, with the present steadily lengthening list of the diseases, the exciting cause of which is certain—we shall be assured that medicine stands abreast of other arts and sciences in the century's advance, and this largely, particularly, in the last two decades, through the work of the bacteriologist.

The physician of 1800 had some knowledge of anatomy, it is true, but small practical use could be made of it in the absence of correct physiology and microscopical anatomy. The acromatic microscope, anæsthesia, and the cell theory toward the middle of the century, and later the subject of bacteriology with antisepsis, powerfully aided this advance, and with steadily increasing rapidity medicine has become what it is to-day.

The subject assigned for this essay is assuredly a broad one, and inasmuch as the line of demarkation between medical and surgical diseases is not a definite one—it depending somewhat

upon the writer's position—the subject matter of this essay may not, in the opinion of some readers, be confined entirely to diseases clearly medical, but may enter somewhat the realms of surgery.

Our later works on surgery and medicine overlap, and must always do so, more or less. But since modern therapeutics is far more logical and definite the diseases have been reclassified, with the result that many lesions hitherto treated medically are now clearly surgical conditions calling for surgical interference, while other diseases, *e. g.*, diphtheria, which, especially in the severer cases, usually demanded surgical treatment, are now, through the results of the researches of the bacteriologists, confined almost entirely to the general medical practitioner.

According to Gould, surgery was formerly that branch of medicine concerned with manual operations under the direction of the physician. The scope of the word is now widened and so bound up with general medicine that a succinct definition is impossible. Instrumental and manual operative work is still the chief idea, and, so far as it is related to diseases commonly or possibly requiring operative procedure, surgery usually includes the treatment of systematic abnormalities. The surgeon has recouped himself by the inclusion in his department of many purely medical subjects not strictly requiring operative treatment, such as inflammations, micro-biology, syphilis, etc.

Obstetrics, practically surgical in every way, is a subject almost always occupying the attention of the family physician. The present exalted position of aseptic midwifery and surgery is almost entirely due to the results of bacteriological studies. Having learned that the great danger of infection results from the transfer of pathogenic bacteria to wound surfaces by the hands or instruments of the operator or his assistants; that pyogenic bacteria are found on the surface of the body, in the mucous membranes of healthy persons; and that sterilization of the hands of the surgeon or obstetrician or of the surface through which incisions are to be made, can be effected by certain procedures which have been elaborated by the experimental methods now in vogue, aseptic surgery and obstetrics take their place as rational methods founded upon scientific observation.

In the further discussion of our subject under "Treatment of Disease" we shall see, without doubt, how Hygiene and Sanitary Science, or Preventive Medicine, as it is now properly termed, have been immensely benefited by the researches of bacteriologists.

It is true that sanitarians had obtained, by observation and empirical methods, important data upon which to found their recommendations before we had any knowledge of pathogenic bacteria, but it is also true that in the absence of this knowledge their recommendations were often inadequate and contradictory, and were without the authority which comes from an exact experimental basis.

This prevention of infection becomes the first duty of the surgeon and obstetrician as well as the physician and sanitary official. And the necessity for treating infected wounds, puerperal septicæmia, or local epidemics of infectious diseases, in the light of our present knowledge, is a reproach which attaches to some individual or corporation.

Protozoa included.—While the term "bacteria" does not include the parasite of malaria, nor the protozoa—the smaller group of the animal parasites—which may prove to be the source of infection in many diseases, such as the exanthemata in one of which —smallpox—they have already been apparently found, still we believe the consideration of the organisms of these diseases is within the domain of the subject assigned.

There is no department of clinical medicine, which we will now consider, which has not relations to bacteriology.

The whole subject has been revolutionized. Text-books written even within the last decade are already out of date, and, since the almost daily discoveries in the realms of bacteriology are so important, the interim between the writing and publication of works on medicine often necessitates "addenda" to bring the book up to date.

The etiology of many diseases formerly merely conjectural, as we have seen, is now positively known. Diagnosis has been materially aided, symptomatology and course of disease is far better understood since we know the causes at work; and, too, the prognosis and treatment is in many cases no longer a matter of guesswork nor of empiricism.

(To be continued.)

MOSQUITOES AND MALARIA AT ISMAILIA.

Major Ronald Ross has completed his investigations into the causes of the prevalence of malaria at Ismailia. Unlike Lagos and Freetown, where, owing to the deluge of rain, mosquitoes find innumerable pools for their larvæ, Ismailia is situated in the midst

of a desert, where a burning, dry wind shifts the sand from hillock to hillock, and covers everything with dust. How, then, if malaria is really carried by mosquitoes, can the presence of the disease be accounted for in such a place as Ismailia? The question has been answered by Drs. Dampeiron and Pressat, the physicians of the Suez Canal Company, who not only have found anopheles in infected houses in the town, but also discovered their breeding places. The subsoil water in the desert round Ismailia is so near the surface that it actually produces a little vegetation, and even something like miniature marshes are said to rise and fall with the fluctuations of the distant Nile. In most places the water is too brackish for vegetation or mosquitoes, but in a few it is fresher, and in two such close to Ismailia, and only a few hundred meters from the houses, the larvæ of the malaria-bearing anopheles were easily found. Small as the marshes are they have produced a sick rate of about 1,000 cases of malaria fever a year. Ismailia itself is copiously irrigated by the fresh-water canal. Major Ross, therefore, expected to find anopheles at Ismailia in the irrigation channels, but this fear proved to be unfounded. The deeper permanent channels contain swarms of fish, which render them uninhabitable for mosquito larvæ, while in the smaller channels the water is at once absorbed by the thirsty sand. Major Ross thinks that the task of exterminating the anopheles will be both easy and cheap. It is only necessary to fill up the two small marshes or deepen them so as to admit fish. As a preliminary on September 24, Dr. Pressat, Sir W. MacGregor, and Major Ross commenced the work by having the pools treated with oil by the newly-formed "Mosquito Brigade." The officials of the company will zealously continue the work, and Major Ross is confident that the town will shortly be rid of the malaria pest. Both Port Said and Ismailia have many mosquitoes of the ordinary kinds, which cause great annoyance. It has been ascertained that they breed in swamps in the subterranean cistern provided for the drainage of the houses. Special men are to be employed to destroy the larvæ every week with oil. Malaria has also existed at the company's water works at Suez. There, again, anopheles were found in some very small puddles in a little marsh close to the water works.—London Letter, *Journal American Medical Association*, Oct. 25, 1902.

DESICCATED MILK AND METHOD OF MAKING SAME.

In our December number we published a report by Robert S. S. Bergh, U. S. Consul at Gothenberg, from the State Department Consular Reports, on "Milk Powder in Sweden." Our attention has been invited since to an earlier, if it is not, indeed, a superior preparation, of the same kind by Joseph H. Campbell, of New York, patented nearly three years ago, and which for the last two years has found a gradual and growing demand. The difficulties with which the inventor has had to contend, and the process of manufacture, are in part described as follows:

Various attempts have been made for many years past to desiccate milk or reduce it to the condition of a dry powder or cake; but prior to my successful accomplishment of this result all such efforts, so far as I am aware, have been failures.

All attempts to concentrate milk to dryness which have succeeded in producing a desiccated product have involved the subjection of the milk to *boiling,* either under atmospheric pressure or *in vacuo.* In either case so high a temperature has been employed as to precipitate the alkaline or basic constituents of the milk and coagulate the milk albumen or casein, rendering it insoluble in water and unsusceptible to the action of pepsin or rennet—that is, non-peptogenic. Hence such products have proved of but little practical value, because the desiccated milk would not *readily dissolve in water for the re-formation of liquid milk,* and even such of it as would so dissolve would *resist* rennet coagulation, and hence would have very little value as a food product.

All other proposed methods of desiccating milk have involved the loss of valuable portions of the milk solids, so that the product has not been a "desiccated milk," correctly so called, but a desiccated constituent extracted from milk.

Prior to my invention no one, so far as I am aware, has succeeded in producing a desiccated milk wherein are combined the non-fatty solids of milk unchanged in proportion or character and wherein the proteids are retained of undiminished solubility and susceptibility to peptic action, or, in other words, a *dried milk which is readily soluble in water as digestible as fresh milk.* I

have found that in order to produce such a product in perfection it is necessary to effect the concentration of the milk at a temperature in the neighborhood of 100° to 120° Fahrenheit and well below 140° Fahrenheit, the point at which coagulation of albumen commences, and that because this temperature is most favorable to fermentation it is necessary to perform the evaporation with great rapidity and by means which shall check the activity of the lactic ferments. The process naturally divides itself into two stages—the first, that in which the milk is treated as a liquid, and the second, that in which it is treated as a semi-solid. The first stage involves the concentration of the milk from its original liquid form down to approximately one-fourth its original weight, or until it reaches the consistency of a paste or very thick cream. The second stage is that in which it is reduced from the pasty consistency to that of a dry solid substance. During both stages the temperature must for a *perfect* product be maintained considerably below 140° Fahrenheit and in the neighborhood of 100° to 120° Fahrenheit, and during both stages there is constant liability to souring of the product. The slightest fermentation defeats the object in view, since it imparts a cheesy odor and flavor to the product.

The product of this process is a nearly pure white powder which consists of the non-fatty solids of the milk unchanged in proportion and unimpaired in character, the milk powder being readily soluble in water, and when so dissolved its casein and other proteids being peptogenic or susceptible of peptic action, and its lime salts and other mineral matters being in their original condition as to solubility. The casein in my desiccated milk is unchanged from that in the natural milk, except that it has become slightly more soluble and peptogenic.

My milk-powder is non-hygroscopic and is so nearly anhydrous as to present every appearance of being perfectly dry. It resembles white wheat-flour in consistency, and may be handled, packed, transported, and kept in the same manner and without necessity for other precautions than those necessary with such flour.

An important advantage of the process is that it tends to sterilize the product. Many deleterious microbes are destroyed by long-continued oxidation, by persistent agitation, and by desiccation. My process effectively combines all three agencies.

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

La Radiologie dans les Hôpitaux.—The Hospital Medical Society of Paris ("Le Progrès Médical," Dec. 27, 1902), understanding that a commission had been appointed by the Director-general of Assistance publique to study the formation of twenty centres of radioscopy and radiography in the hospitals, has discussed the question in secret and has adopted unanimously the following recommendations, which were immediately sent to the Director-General.

"The Hospital Medical Society, grateful to the Director of Public Assistance for granting Paris hospitals apartments for the investigation by means of the Roentgen rays, thanks him for accepting the advice of the physicians and surgeons and adding this important means of investigating and diagnosing the many obscure cases that are presented for their investigation.

"The Hospital Medical Society expresses its recognition of the favor conferred, and confidently hopes for its early adoption and generous support by the intelligent Municipal Council of Paris." It wishes:

"First—That each hospital be furnished with a separate hall for the radiological exploration according to the radioscopic and radiographic methods, both of which are indispensable.

"Second—That in the apartments appointed for this exploration the necessary space for photographic operations, especially the dark chamber, be appointed.

"Third—That the care of the instruments for radiographic exploration be entrusted in each hospital to a young man possessing an indispensable theoretical and practical knowledge of the technical part and a solid medical training, rather than to an interne either in service or resigned, and that he have, according to the importance of the hospital, one or more infirmarians, who will have the care of the instruments and keep them always in good condition.

"Fourth—To limit as much as possible the expense required for the new system, the radiographic examination should be preferred for the first stage, or it should be the first part of the complete

study, and may be entirely satisfactory. It is recommended that the poor be treated free of charge."

EVOLUTION OF WHITE GLOBULES.—M. Joly ("Progrès Médical," Nov. 29, 1902) has given much attention to the evolution of the white globules, and has shown the analogy that there exists with the epithelial cylindrical cells in certain mucous bodies, and thinks it a most interesting study in connection with the subject of spermatogenesis.

DEMINERALIZATION OF THE ORGANISM.—M. Albert Robin has made a special study of the diseases in which organic demineralization acts a most important part ("Gazette Hebdomadaire," Dec. 21, 1902). The title of his communication to the Académie de Médecine had for title, "De l'Anémie plasmatique." The following are his conclusions:

"There are a group of morbid conditions that have for one of their conditions, if not of their causes, either a demineralization of the organism or a want of fitness of the plasma or of the tissues to determine the inorganic principles of alimentation.

"Phthisis pulmonaris, phosphorisms, albuminuric disturbances, hemoglobinuria, the different forms of chlorosis, are characterized by demineralizations, which indicate an impoverization of the plasma of the blood. Biological chemistry serves to find what is wanting in the plasma to restore its full power of nutrition. It is necessary to analyze both the urine and the blood in order to determine the proper medical treatment.

"To treat and to cure plasmatic anemia in a way, so to say, mathematical, it is necessary to restore the saline equilibrium of the plasma of the blood, and this is most rapidly effected by employing a union of the salts of the blood with different organic principles, the union of which represents a sort of mineral therapy.

"This mineral reconstruction of the plasma of the blood requires from fifteen to fifty days, according to the nature of the case. It is made evident by an increase of the mineral principles in the blood and by a diminution of the inorganic in the urine, notwithstanding the daily ingestion of the daily medicinal mineral salts.

"When the saline equilibrium of the plasma of the blood is restored, M. Robin says, it becomes necessary, as a second therapeutic measure, to begin the ferruginous medication, which then

acts with surprising rapidity on the external evidence of chlorosis. But this secondary course may be avoided by associating the ferruginous treatment directly with the saline."

THE LARYNGEAL NERVE AND RESPIRATION.—M. Laborde ("Progrès Médical," November 22, 1902) explains the rôle of the superior laryngeal nerve, which has a double action. It is a nerve causing restraint when it is excited during the regular mechanical action of the respiration; if it is excited during a period of inaction, it is an excitant: the respiratory movements reappear, little intense at first, then gradually more active, until the normal rhythm is restored. This is the property to be used in cases of asphyxia.

THE CURATIVE EFFECT OF THE VAPORS OF FORMALIN IN WHOOPING COUGH.—Dr. Jezdik Cenex, Hlinske, Bohemia, reports ("Zeitung der boehmischen Aerzte," Prague, September 14, 1902) the case of "a nurse girl, fourteen years old, who, on account of a very rough cough, had been sent from school and taken into service. The child she attended very soon became ill. The girl must have had the cough for many weeks; it was of a distressing nature, and frequently ended in vomiting. The attacks mostly occurred during the night. Without trying any other medication I placed the child with the girl in the sitting-room, lighted the Formalin lamp, and evaporated four or five tablets per 1,000 cubic feet of air space. The children remained in this room for about half an hour; they were then taken from the room, which was disinfected by a larger number of Formalin tablets, about thirty to 1,000 cubic feet. Shortly after this the children appeared paler, and also had less appetite. There was a little irritation of the eyes, which had a sleepy appearance. Any other symptoms which could indicate any harmful effects of the Formalin vapors I did not observe. The same night after the Formalin inhalation the girl coughed very much less, and afterward not at all. The child had lost its cough entirely.

"After this experience and other trials with the Formalin vapors, and the knowledge which I had gained in the continuous use of Formalin for the disinfection of my ordination and consulting rooms, and also of the houses of my patients, I was induced to adopt a systematized use of the vapors of Formalin for curative purposes. My patients inhale the Formalin vapors in the sitting-

room, and after retiring, the room is thoroughly disinfected by an increased quantity of Formalin gas (about thirty tablets to the 1,000 cubic feet), evaporated from Schering's Formalin.

"Sometimes I have found that children, after the inhalation, become a little sleepy, which may, however, be explained by the slight irritation of the conjunctiva."—He cites a number of other cases and concludes that: "(1) By the proper inhalation of the vapors of Formalin it is possible to destroy the germs of whooping cough—those existing on the mucous membrane of the respiratory organs, and also those in the surroundings of the patients. By this means the disease is cut short and further infection inhibited.

"(2) If we consider that the removal of the patient in whooping cough acts beneficially upon the disease, it is only reasonable to expect that the disinfection of the patient's dwelling is sufficient to frequently effect a cure.

"(3) In accordance with these experiences it seems advisable that schools, hospitals, churches, and other localities should from time to time be thoroughly disinfected."

FOOT-AND-MOUTH DISEASE (Circular No. 38, Bureau of Animal Industry, U. S. Department of Agriculture) is an exceedingly contagious malady peculiar to ruminating animals (cattle, sheep, goats, deer) and swine, that has been recently brought from some foreign country, and has appeared in a few localities in Massachusetts and some adjacent States. Rarely is it transmitted to man. It is characterized by the eruption of vesicles or blisters in the mouth, upon the heels, or between the toes, and upon the teats or udder. The appetite is depressed, the milk flow diminishes, the animal loses condition and becomes lame. After a day or two the vesicles break, peel off, and leave a raw surface that may heal in a few days, or, especially upon the feet and teats, that may remain sore for a long time and lead to serious complications. The death rate is very low, but it attacks the whole herd, and many animals are seriously damaged, so that the loss to a herd owner is heavy.

With our much larger holdings of live stock in this country, the possible losses from this disease, if it were to become general, are stupendous and incalculable. At present the disease exists over a comparatively small area. It is confidently believed by the experts who have investigated the situation that it can be controlled and eradicated. It is important that this shall be done, not only

that the other parts of the country shall be protected, but also to prevent the frequent visitations of the disease that otherwise would afflict the live stock of New England. To this end, the aid of all stockmen and farmers is requested.

The most important matter is to prevent the infection of animals not yet exposed. This can be done by avoiding the purchase of affected stock; by excluding all outside animals from the herd or flock; by each person who comes near healthy stock avoiding contact with diseased animals or the places or things contaminated by them; by excluding visitors from the cow stable, sheep and hog pens; and by preventing the access of strange or stray animals, which may carry the virus on their feet or hair, although they are themselves in good health. Neither cows nor bulls should be moved from one place to another for service.

Should the herd or flock become infected, the appearance of the first evidence of disease should be immediately reported to the Chief of the Cattle Bureau, a State Cattle Commissioner, the local inspector of live animals, or to the Bureau of Animal Industry office, 147 Milk street, Boston, Mass.

The eradication of this disease and the removal of all quarantine and other restrictions upon the cattle trade can be materially hastened by the live stock owners themselves, if they will promptly report the first evidence of foot-and-mouth disease in their herds or localities. This fact cannot be suppressed, and the sooner it is brought to the notice of the proper authorities, the less the resulting damage will be.

THE VALUE OF TRIKRESOL AS AN ANTISEPTIC IN OPHTHALMIC PRACTICE.—Edward Jackson, A. M., M.D., Denver, Col., reports in "Ophthalmic Review," London, June, 1902: In 1894, E. A. de Schweinitz recommended an aqueous solution of Trikresol 1:1000 as a basis for collyria. In 1897 he reported before the Section on Ophthalmology of the American Medical Association (p. 104 of its Transactions), that such solutions placed in loosely-corked bottles and exposed to the air remained free from bacterial contamination after a lapse of three years.

Jackson's experience with this solution has convinced him that it constitutes a more nearly ideal antiseptic than any yet tried in ophthalmic practice. Applied to the conjunctiva it causes only a momentary sensation of burning, comparable to the transient smarting induced by simple solutions of eserin or cocain. He has used it with entire satisfaction as a basis for solutions of cocain,

eserin and most of the mydriatics. As an antiseptic wash it is superior to boric acid, which, as is well known, readily becomes contaminated with low vegetable forms. Its advantages in this connection are summed up as follows: 1. It is free from risk of making the eye worse in any respect. 2. It is an antiseptic solution that will at least keep itself clean. 3. It has a distinctly germicidal influence when used to wash out the conjunctiva.

While the solution of 1 to 1,000 has a very perceptible odor of Trikresol, this smell does not remain noticeable about the patient on whom it has been used.

In all respects it seems superior to carbolic acid to lay instruments in, to keep them from contamination after cleansing.

It is superior to formaldehyde solutions for this purpose, because there is no need to remove a source of irritation by rinsing the instrument coming from it in something else before using it upon the eye.

OCULIST (after examination of the eye): "Yes, it is, as I supposed, a case of choroiditis exsudativa, accompanied by partial micropsia, metamorphopsia, and chromatopsic scotomata of singularly regularly forms."

Young lady: "There! And ma said it was only a sty coming."

HORSE-CHESTNUTS AS FOOD.

Dr. Loves, of Hanover, presented at a recent meeting of German naturalists and physicians, a paper on this topic. He said that if the ground seed be macerated in alcohol, the bitter principles are extracted, and the residue, a white, tasteless powder, is of high nutritive value. The analysis of the seed gives 8 per cent. proteid, 7 per cent. fat, 77 per cent. nitrogen-free extract, and 2.6 per cent. ash. The nitrogen-free extract contains about 14 per cent. of cane sugar (in the unripe seeds invert-sugar is present), 13 per cent. of glucosides, and 0.2 per cent. of tannic acid. The ingredients that pass into the alcohol include certain phenolic bodies and a substance resembling saponin. The process is covered by patent (now being operated), and it is also proposed to utilize the carbohydrates for the production of alcohol. It is said that 25 litres of alcohol can be obtained from 100 kilos of seeds, and that a plantation of trees will yield yearly 400 marks per hectare (about $40 per acre.)—*American Journal of Pharmacy.*

EDITOR'S TABLE.

SANITARIAN, FEBRUARY, 1903.

Embarrassment incidental to the death of the intended manager, under the new business arrangements, announced in October number, delays the completion of the organization. Meanwhile:

All Communications, business and otherwise, all exchanges and all publications for review, should be addressed to the Editor, as heretofore: Dr. A. N. Bell, 337 Clinton Street, Brooklyn, N. Y.

SALT WATER FOR FIRES AND DUST.

THE SANITARIAN is gratified, after more than a dozen years repeatedly urging the use of salt water for extinguishing fires, street sprinkling and gutter flushing, and for the economy of the water supply in Brooklyn, in particular, that plans are now being devised for the purpose. By a leading editorial in the Brooklyn "Eagle," January 8th, the public authorities seem to have been stirred to this measure as a necessity to meet the requirements of the underwriters of fire insurance, the rates on risks in Brooklyn having been advanced 25 to 30 per cent. on account of the insufficiency of the water supply. Though nothing has as yet been formulated for the salt-water supply, several plans have been suggested by which it may be effected, one of which is, as quoted from a communication to the Mayor by John R. Kuhn, a lawyer of Brooklyn, with the request that it be laid before the engineers for examination and report, that:

"The place is to pump water to the top of the bridge towers and cause it to flow thence to reservoirs to be constructed upon Fort Greene, Prospect Park, Forest Park, Sunset Park and other elevated stations in various sections of the city. From these reservoirs a separate system of mains and pipes would convey the supply through the streets.

"The bridge towers are higher than the surface of any part of the city; higher than the proposed reservoirs, and are admirably suited for the purpose. When this project was submitted to a former administration it was not favored because of the suggestion that tanks should be erected on the towers. The engineer-in-chief refused to consider anything that would render the towers unsightly. A receptacle, invisible from below, to receive the water from the pumps and convey it to the pipes would be suffi-

cient. The pipes alongside the towers might be made ornamental or hidden from view. Only one pumping of the water to the towers would be necessary; thence it would flow by its own gravity into the reservoirs.

Other and more comprehensive plans are suggested with reservoirs conveniently located in different sections of the city to meet all requirements.

Regarding the feasibility of this project the fact is cited that the City of London was supplied with water from the River Thames for nearly two hundred years by a similar plan.

STREET CAR SANITATION.

The Committee of the Merchants' Association on Franchises and Transportation has received from George A. Soper, a sanitary expert, a letter concerning the sanitation of street and elevated cars supplemental to that which he submitted to the committee several weeks ago.

In his second letter Mr. Soper enumerates the measures which he considers essential to the public health, as follows: The prevention of expectoration, improvement in the existing means of ventilation by means of screens outside the transoms to exclude gusts of wind, and a device whereby the transoms may be operated from the ends of the car; the use of movable floor grating of a non-porous nature and of leather or some other smooth-faced material for seat coverings; electric lights to be placed at the sides of cars above the windows so as to furnish a proper light for reading; cuspidors of ample size to be placed in stations of the elevated railroad, and public toilet rooms in elevated stations to be kept clean and in order.

In the designing of new cars Mr. Soper advocates the following changes on the plans now followed: Greater seating capacity as compared with the room now provided for standing passengers; a higher roof, which may give better ventilation; improved heating and lighting facilities, lower and wider steps on both open and closed cars, and the avoidance of all unnecessary paneling and molding on which germ-carrying dust may collect.

CHILD LABOR.

The apparently recent discovery of the extensive employment of children in Southern cotton factories, of which we published an account from the "Outlook" in October, has had the effect of awakening attention to the scarcely less extensive stunting process

in the North. Attention was forcibly directed to it in the State of New York, a month ago, by Governor Odell in his message to the Legislature. It has been agitated to a very considerable extent in the metropolis, and the work of organizing a special effort for its prevention is, at the time of this writing, in active process. The public-spirited officers of the University Settlement and the new Council for Civic Co-operation in New York City, are united in the effort to overcome the evil, and have issued a statement of purposes headed: *The Need of Better Child Labor Laws.* In part as follows:

"We, the undersigned, believe that grave defects exist in the present Child Labor and Compulsory Education Law, to the great injury of the rising generation and of society at large.

"New York ranks with Massachusetts, Connecticut, Ohio, Indiana, Illinois, Michigan, Minnesota and Wisconsin as one of the States which have for several years forbidden the employment of children under fourteen years of age in factories and mercantile establishments.

"In this State are, however, by reason of defects in the factory and mercantile law, large numbers of children at work in factories and stores under that age, in spite of faithful work of the inspectors and with no violation of the law on the part of the employers.

"In his latest report the Factory Inspector states that the provisions for enforcing the factory law are totally inadequate, and makes an important recommendation for an improvement in the law—that a change be made in the *system by which certificates of employment* are issued to children.* He points out that there is a large number of children at work under the legal age of fourteen owing to the impossibility of enforcing the law under the present system."

Other defects are designated in detail with nearly a hundred of prominent and influential citizens. Meanwhile the work of investigation is pushed by special inspectors procuring information in promotion of the purpose.

UNUSUAL EMPLOYMENTS FOR WOMEN.

Maxwell's Talisman states that among *other* unusual employments for women, are 100 workers as "lumbermen and raftsmen," 113 wood choppers, 373 sawmill employes, 440 bartenders, 2,086

*The State Inspector of Factories, in his report says, "The only sure preventive of such evasions of the law, which have always been numerous, is the requirement for a certificate of employment of official evidence of the age of the child derived from public records of births."

saloon-keepers, 904 "draymen" and teamsters, 323 undertakers, 143 stone cutters, 63 "quarrymen," 65 whitewashers, 11 well-borers, and 117 stationary engineers and "firemen."

HYGIENE AT TEACHERS' COLLEGE.

The faculty of Teachers' College has decided to give instruction in hygiene next year by providing twenty distinct courses in physical education. Among the subjects to be taught are child study, school psychology, physiology, bacteriology, gymnastics, physical education, the theory and practice of teaching physical education in secondary schools, anthropometry and the history of physical education. The instruction is to be given in the new $250,000 gymnasium now being erected in One Hundred and Twentieth street near Broadway. This, besides serving the purposes of a gymnasium, will contain physical laboratories and appliances for physical education. Dr. Thomas Denison Wood will have charge of this new departure in the university's work.

HALF A CENTURY OF CHILD SAVING—FIFTIETH ANNUAL REPORT OF CHILDREN'S AID SOCIETY OF NEW YORK.

It is not every day that a half century of activity in one direction is placed before an annual meeting, yet that was the case when Secretary Loring C. Brace read his report last week for the Children's Aid Society of New York, here reproduced from "Charities."

The name of Brace stands for a definite policy in the care of dependent children, and the working out of that policy was reviewed at some length in contrast to what might be called the institutional methods of certain other organizations. The possible shortcomings of the latter methods were clearly indicated. Of the Society's own accomplishment, the report enlarges in detail. It first outlines the "beginning of an association which, by its work and through its example to other organizations, has done more for the rescue of the helpless and the ignorant than any other charity in New York.

"What is the explanation of this success?

"As we study the records, and particularly the eloquent and earnest appeal for support issued by Mr. Brace in March, 1853, three things are plain to us:

"First—The enormous number of vagrant children at that time on the streets.

"Second—That here is a group of earnest men who are determined to improve this state of affairs.

"And third, that at last the plan, the principle, is found on which a successful effort may rest. That principle is to give to the children of the poor and unfortunate the means of self-help and to encourage them to use the means.

"This principle underlies all the work of the Society, and our success is due to the fact that in every effort we have kept this principle before us, bearing in mind that the child can be reached and saved, not by compulsion, but by co-operation, by calling out the best there is in that child, and helping it to use the best.

"We find in all kinds of humanity a divinely given, uplifting power, stronger than the down-pulling influence of heredity. Remove the child from bad environment before the age when instincts are polluted, and place him amid good family surroundings where he will develop naturally in the discipline of every-day life, and he will grow in moral health and strength exactly as the average child does.

"If, however, the children, although living in evil environment, may not be removed from their parents, then we must establish for them schools where good women provide the teaching and the motherly influence, by means of which the children may see for themselves the direction in which lie better things, and uplift themselves out of the swelter of ignorance and poverty about them.

"The Lodging-houses for homeless boys, the Probation Department and the Farm School, are designed to give wayward boys the opportunity to help themselves in better ways of living. Our agents watch over them with friendly advice, with unending patience, overlooking small peccadilloes, forgiving backslidings, always with a hand ready to lift up the boy or girl who has tripped, to point out wherein was the mistake, and with friendly touch to encourage them to try again.

"As time brings to us experience, we are more and more convinced that it is not the long years of training in an institution, school or reformatory which counts in the development of character, but that it is the struggle to keep honest amid the temptations of real life which strengthens moral tone. The sheltered life of the institution cannot give this training. It is the natural home life, and the loving interest of foster-parents in co-operation with the careful attention of our agents, that has made our work among orphans and abandoned children so successful. They are quickly

placed in family homes, and the social forces around them urge them on to achieve what careers they can. No institution, reformatory, or orphanage has met with anything like the success of the Children's Aid Society, and yet the institutional plan costs ten times as much and more.

"With little or no endowment, and at a cost of but three-fourths of a million dollars, we have rescued and placed in family homes 22,528 orphan or abandoned children, provided situations at wages in the country for 24,864 older boys and girls, and restored 5,207 runaway children to parents. Of those placed in family homes in the West, the vast majority have become farmers or farmers' wives. Of the others, we know that one became Governor of a State, and one of a territory, two have been members of Congress, two sheriffs, three district attorneys, three county commissioners, and several have been members of State legislatures. In the business world twenty-six became bankers, four hundred and fifty-one are in business, thirty-four are lawyers, twenty-two are merchants, seventeen are physicians, eight are postmasters, thirty-nine are railroad men, several being high officials, ten are real estate agents, fifteen are journalists, eighty-five are teachers, several being high school principals, and one a city superintendent of schools, one a civil engineer; over one thousand entered the army and navy, and twenty-one are clergymen.

"What a record is this! No other method of caring for dependent children compares with this, either in results accomplished or money saved. It is no new gospel. It is a living witness to the old social order—family life, parental love and influence, the training of each day's common experience. How infinitely better is this plan than the custom forced upon New York by unwise laws under which our busy magistrates commit children to institutions in such numbers that, at this time, twenty thousand children are in confinement at enormous expense to the taxpayers and to little purpose."

WHATEVER THE DRAWBACKS of New York in other respects, it has beaten the record in the matter of letter delivery.

A letter was recently sent from Paris to New York with the following address upon the envelope written in French:

"To a gentleman, now living in New York, formerly a general in the Mexican army, who was traveling in France three months ago. He has a very dark face and green eyes. He speaks French fluently and is very polite."

Was this vaguely addressed missive packed off at once to the Dead Letter Office? Not at all. It passed through the hands of one carrier after another, until it fell into the hands of one who knew that a gentleman answering to the description lived upon his route. The "green eyes" item was a pointer. He remembered that the gentleman's eyes were, to say the least, "peculiar." He delivered the letter within three weeks after his arrival, and earned a proud distinction among his mates.

DEGREES IN THE SCIENCE OF PUBLIC HEALTH.

Glasgow University has been empowered recently to confer two new degrees—Bachelor of Science of Public Health and Doctor of Science of Public Health. The former degree will be conferred upon those who, after graduating in medicine, have received practical instruction in bacteriology and the pathology of the diseases of animals transmissible to man, and have been for five consecutive months in the public health laboratory of a university, and later have studied practical sanitary work under a medical officer of health. The second degree will be open to those who have held the lesser degree for five years, and one of the conditions is that each candidate shall present a thesis or published memoir or work to be approved by the senate.

VACCINATION ANTAGONIZING WHOOPING COUGH.

Dr. Dietrich, of Algeria, and also several leading Italian physicians, after extended observations with results enumerated, have reached the conclusion that vaccination not only has a marked curative effect on whooping cough, but also confers a degree of immunity against that disease.

A like conclusion, with regard to measles and scarlet fever, we had occasion to cite forty years ago—Essay on Vaccination, New York State Medical Society, 1864 (SANITARIAN, Vol. x, 161)—as recorded in "MacCulloch's Statistical Account of the British Empire Three-quarters of a Century Ago."

PRACTICAL PHILOSOPHY AND VEGETARIANISM.

HERBERT SPENCER, having tried vegetarianism, is now said to be poking fun at it, greatly to the surprise of its votaries, who prematurely claimed him as one of their own. After a year's trial he is reported to have said recently: "I went over all I had written during the year I practised vegetarianism, and consigned

it to the fire." And since then he has been saying some facetious things about the "devotees of the truck garden," as he now calls the vegetarians.

POISONED OYSTERS AND TYPHOID FEVER.

An epidemic of typhoid fever appeared about the middle of December at Portsmouth, Southampton, and other towns on the southern coast of England, traceable to oysters taken from oyster beds at Emsworth, poisoned for the culpability of the civil authorities, since it appears that as long ago as 1895 an inspector to the Local Government Board reported that the oyster bed in question could not escape pollution by sewage. It is said that some attempt to intercept the sewage was then made, but it seems to have been no one's duty to see that this was properly done, and it was not. So now another outbreak has occurred, and the Local Government Board has again taken it up. Meanwhile, Mr. T. D. Foster, an oyster merchant, has taken action for £15,000 damages against the town, owing to his loss of business in consequence, as he alleged, of the contamination of his oysters by the town sewage.

The statement of his solicitors was that Mr. Foster's fleet of eleven steam and sailing smacks, with 100 men, were lying idle, and as the trade had fallen off, owing to the reports before the public, he had been compelled to employ the men in removing his oysters to a place of absolute safety at Hayling Island. The council, after an animated debate, decided to reply that instead of the council taking any contamination to the oysters, Mr. Foster had brought his oysters to the drains, which were there before the oyster beds. They denied responsibility, and expressed their determination to resist any demand for compensation. It was stated that if Mr. Foster recovered the damages claimed it would impose upon the town a rate of 25s. in the £1.

It was, however, decided to take steps for the improvement of the drainage scheme of the district.

UNCHRISTIAN SCIENCE.

The Supreme Court of Georgia has handed down a decision which the advocates of "Christian Science" regard as a victory for them. The decision holds that parents are not compelled to give medicine to their minor children when they become ill, and that failure or refusal to give medicine to these children is not a violation of the laws of the State. A christian scientist, named Jus-

tice, refused to give medicine to one of his children when it became ill and refused to allow a physician to attend the child. After an illness of several days the child died. The neighbors of Justice swore out a warrant for him charging him with failure to provide the necessary sustenance to the child, a crime under the laws of the State of Georgia. This was the only charge upon which they could prosecute. The case was tried in the City Court of Dublin, where the man lived, and he was fined $300. He appealed the case from one court to another until it reached the Supreme Court, which reversed the decision of the lower courts.

MORTALITY AND MORBIDITY REPORTS AND REVIEWS.

NEW YORK.—Monthly *Bulletin* of the State Department of Health for November reports the percentage of deaths under five years of age in the districts into which the State is divided, severally, was, for the Maritime District, 28.3; Hudson Valley, 16.0; Adirondack and Northern, 14.7; Mohawk Valley, 20.7; Southern Tier, 12.4; East Central, 12.6; West Central, 12.5; Lake Ontario and Western, 13.0; entire State, 14.7.

The death rates, respectively, were: Maritime District, 16.0; Hudson Valley, 18.4; Adirondack and Northern, 12.0; Mohawk Valley, 19.4; Southern Tier, 13.0; East Central, 12.6; West Central, 16.5; Lake Ontario and Western, 14.0. Total number of deaths from all causes, 9,010. Death rate, 16.0.

The lowest death rates were: Elmira, 12.0; Syracuse, 13.0; Buffalo, 13.6; Oswego, 14.3; Rochester, 14.7. The highest, Amsterdam, 27.5; Albany and Troy, each, 20.0; Poughkeepsie, 18.7; Yonkers, 18.5; Utica and Lockport, each, 17.0.

During the three fall months just past the actual mortality has been less than the average for the past five years by about 250 deaths, and relatively to the population, the death rate has been considerably less, or about 15.5 per thousand living, against 16.5. There has been a saving in deaths of early life, which is notable, 600 fewer deaths having occurred under the age of five years than the normal. There were likewise somewhat fewer deaths at the other extreme of age, past seventy years. There has also this year, as compared with recent years, been a saving during the autumn months in the mortality from the ten or more common infectious diseases, which are below the average numerically by the decrease in the total number of deaths, 250. All of these dis-

eases caused fewer deaths than the average, except scarlet fever, whooping cough and smallpox. Consumption, which is attended with a pretty uniform mortality, caused 2,900 deaths in the three fall months, 200 less than the average.

Smallpox.—During September and October there was comparatively little smallpox in the State, but in the last two months it has become more widespread. The present chief centres are Rochester, where in November there were 144 cases reported, and 173 in December, and whence it spread to six adjoining towns in Monroe county, and to seven more remote localities, 35 cases in all. At the end of the year there are 24 cases in Monroe county, outside of Rochester, where the outbreak is believed to be decreasing; at Buffalo, Syracuse, Olean, Bristol and Yost's, Montgomery county, 9; in Clinton and Essex counties, 17; Ellicott, 3; Salamanca, 3; Lyons, 1, some 60 cases in all. There were 19 deaths in Rochester and 1 in Brooklyn during the month.

New York City report for the quarter ending June 30: Marriages, 9,604; births, 18,725; deaths, 17,173; still births, 1,525. Reports of births, marriages and still-births are incomplete. Actual number of deaths from zymotic and certain other preventable diseases in Borough of Manhattan, 1,850,093: Cerebrospinal meningitis, 45; diphtheria and croup, 313; typhoid fever, 52; malarial fever, 12; measles, 81; scarlet fever, 170; smallpox, 4; whooping cough, 95; diarrhœal diseases, 458; phthisis, 966; all causes, 9,263; deaths in institutions, 2,851; deaths under five years of age, 3,215.

Borough of the Bronx, 175,422: Cerebrospinal meningitis, 4; diphtheria and croup, 21; typhoid fever, 8; malarial fever, 6; measles, 48; scarlet fever, 79; smallpox, 93; whooping cough, 28; diarrhœal diseases, 41; phthisis, 278; all causes, 1,273; deaths in institutions, 514; deaths under five years, 414.

Borough of Brooklyn, 1,166,582: Cerebrospinal meningitis, 13; diphtheria and croup, 201; typhoid fever, 54; malarial fever, 10; measles, 109; scarlet fever, 92; smallpox, 49; whooping cough, 51; diarrhœal diseases, 395; phthisis, 610; all causes, 5,704; deaths in institutions, 1,062; deaths under five years, 1,982.

Borough of Richmond, 67,021: Cerebrospinal meningitis, 3; diphtheria and croup, 3; typhoid fever, 2; scarlet fever, 6; whooping cough, 3; diarrhœal diseases, 7; phthisis, 30; all causes, 271; in institutions, 77; under five years, 40.

Borough of Queens, 152,299: Cerebrospinal meningitis, 4; diphtheria and croup, 26; typhoid fever, 2; malarial fever, 1;

measles, 5; scarlet fever, 3; whooping cough, 4; diarrhœal diseases, 46; phthisis, 57; all causes, 662; in institutions, 72; under five years, 231.

For the four weeks ending January 10, 1903: Cases of infectious disease reported: Consumption, 883; diphtheria and croup, 1,305; measles, 500; scarlet fever, 678; smallpox, 5; varicella, 322; typhoid fever, 317. Total deaths from all causes, 5,005; death rate, 17.72.

CALIFORNIA.—San Francisco, 342,782. Report for November, 1902: Total number of deaths, 579; death rate, 19.29, as against 564 for November, 1901, when the rate was 18.79. During the week ended November 29 there were 165 deaths registered, which is greatly in excess of the normal rate for similar periods in past years. The principal causes of death were: Diphtheria, 14; typhoid fever, 14; cancer, 35; tuberculosis, 77; cerebral apoplexy, 21; diseases of brain 17, of heart 69, of respiratory system (including pneumonia) 57, of digestive system 39; Bright's disease, 25; accident, 50; homicide, 3; suicide, 14.

The *plague* situation, according to most recent reports, has not improved. Case 93, since outbreak, Chinese, died December 11. The conditions continue to be a menace to the whole country, and the more by reason of the attitude of the authorities. Governor Gage, in his latest, and it is to be hoped, his last deliverance, at the opening of the Legislature, January 7, reiterates his denial of any existence of the plague in San Francisco at any time, despite the pathological demonstrations of experts of the highest repute. He says:

"The temporary quarantine established over the State June 16, 1900, through the interest, ignorance, over-zeal or possible vindictiveness of Dr. Kinyoun, for a time checked many of our exports and, besides, injured the fair name of our State for health.

"For several weeks previous to the said quarantine, after a long and careful personal examination and inquiry in San Francisco, entailing much labor, in which I was assisted by many impartial eminent physicians, bacteriologists and representative citizens, I arrived at the true conclusion that no case of bubonic plague had been found to exist in San Francisco or elsewhere in the State. . .

"The people of the State owe a debt of gratitude to the members of the present State Board of Health and their assistants for the zealous, painstaking and successful discharge of their many difficult duties in this connection."

All this injury to the fair name of the State is due to his persistent incredulity and inaction, sustained by the State Board of Health. Had they acted with energy commensurate with the importance of the subject to the State and the country at large, there would have been no such injury. On the contrary, the plague there would have been promptly extinguished, the Governor and his subordinates would have received the praise, instead of the condemnation now justly awarded them for their negligence and the consequent danger to the country.—Telegraphic news at the time of this writing:

"Austin, Tex., Jan. 16.—State Health Officer George R. Tabor to-day received a telegram from President Licèaga, of the National Board of Health of Mexico, saying that during the month ending yesterday there had been 116 deaths from bubonic plague at Mazatlan, that no report had been received from Fusenada, Lower California, since December 25, but that up to that time only two deaths from the plague had occurred there.

"Dr. Tabor also received a telegram from Surgeon-General Wyman, of the United States Marine Hospital Service, saying that all border points are well guarded to prevent a spread of the disease to this country. Dr. Tabor was also advised that the plague was taken to Mazatlan from San Francisco, and not from China, as originally reported."

The forthcoming meeting of the U. S. Public Health and Marine Hospital Service, in conjunction with representatives of the State Boards of Health throughout the country, is especially timely with regard to necessary measures to prevent the further spread of the disease.

COLORADO.—Denver, 150,000. Bureau of Health report for November: Total number of deaths, 223—38 under 5 years; deaths from phthisis, 43; diphtheria, 5; typhoid fever, 9; erysipelas, 1; cancer, 5; death rate per 1,000 per annum is reported to have been 17.84. Infectious diseases reported: diphtheria, 86; scarlet fever, 55; typhoid fever, 14; smallpox, 31; erysipelas, 4; measles, 3; chickenpox, 3.

CONNECTICUT.—Bulletin for December, 1902: Deaths, 1,298, 215 more than in November, and 158 more than in December of last year, and 76 more than the average number of deaths in December for the five years preceding. The death rate was 17.5 for

the large towns, for the small towns, 16.0, and for the whole State, 17.1. The deaths reported from infectious diseases, including diarrhœal, were 230, being 17.7 per cent. of the total mortality.

Smallpox was reported in 9 towns, 38 cases; *measles* in 37 towns, 149 cases; *scarlet fever* in 49 towns, 180 cases; *diphtheria* (and croup) in 35 towns, 159 cases; *whooping cough* in 18 towns, 594 cases; *typhoid fever* in 20 towns, 44 cases; *consumption* in 9 towns, 14 cases.

The total deaths for the calendar year 1902, as certified by the registrars of the 168 towns in the State, was 14,376; this was 480 less than in 1901, and 1,992 less than in the year 1900, also 330 less than the average of the previous 10 years. When it is remembered that three of the most contagious and often the most fatal diseases, to wit, measles, scarlet fever and diphtheria, have each occurred in more than 100 of the 168 towns in the State, and that smallpox has been present in about one-fifth of the towns in Connecticut during the year, it is remarkable that the number of deaths has diminished rather than increased.

DISTRICT OF COLUMBIA, 292,367—89,632 colored. Report for the week ending January 3, 1903: Deaths, 122—9 under five years. Death rates, white, 17.1; colored, 31.9: 24.5. Deaths from consumption, 11; pneumonia, 16; diseases of heart, 10; diseases of kidneys, 10; typhoid fever, 4.

ILLINOIS.—Chicago. Statement of mortality for the week ended Jan. 10, 1903, compared with the preceding week and with the corresponding week of 1902. Death rates computed on estimated populations of 1,885,000 for 1903 and 1,820,000 for 1902: Total deaths, all causes, Jan. 10, 1903, 625; Jan. 3, 628; Jan. 11, 1902, 516: death rates, respectively, 17.29, 17.36, 14.79.—Of the deaths for the week ending Jan. 10, 161 were under five years. Deaths from bronchitis, 30; consumption, 59; cancer, 24; diphtheria, 11; heart diseases, 45; pneumonia, 135; typhoid fever, 29; scarlet fever, 16; whooping cough, 10.

"Fully 10 per cent., or nearly 200,000 residents of Chicago, are to-day suffering from ailments of a grave character caused by privation and exposure resulting from the coal famine. Already these ailments are reflected in the enormous increase of deaths among those at the extremes of life—the young and the aged, in

both of whom the powers of vital resistance are at the lowest. Since the first of the year there has been an increase of nearly 20 (19.2) per cent. in the number of deaths among those under 5 years of age over the number in the corresponding period of last year, when this death rate was about normal. Among those over 60 years of age the increase is much greater—24 per cent. last week over the week previous, and 36.7 per cent. over the normal rate of the corresponding period of 1902."

INDIANA.—December reports to the State Board of Health show that: Smallpox for the 23d consecutive time leads the list as the most prevalent disease. Then follow in the order given, tonsillitis, rheumatism, bronchitis, pneumonia, influenza, typhoid fever, intermittent fever, scarlet fever, pleuritis, diarrhœa, diphtheria, erysipelas, inflammation of bowels, whooping cough, measles, dysentery, puerperal fever, cerebrospinal meningitis, cholera infantum, cholera morbus. Attention is again called to the fact that diseases of the intestinal tract, such as dysentery, cholera infantum, and cholera morbus, become less prevalent during the winter months, simply because germ poisons in foods are not generated when it is cold. This should teach us to watch our foods with the greatest care in the summer months and protect them from ferments and germs. Attention is also invited to the fact that tonsillitis, bronchitis, pneumonia, influenza, coughs and colds, which are diseases of the respiratory tract, prevail in the winter months because these people shut themselves in unventilated apartments. Diseases which attack the breathing organs are almost entirely due to breathing foul air. Let this be a lesson not to breathe foul air, but to thoroughly ventilate our bedrooms, our homes and all public places.

The number of deaths reported during the month was 2,634, which makes a death rate of 12.3. This is an improvement as compared with the corresponding month last year, when there were 2,842 deaths, which is a rate of 13.3. The deaths by important ages were as follows: Under 1 year of age, 431; 1 to 5, 166; 5 to 10, 74; 10 to 15, 56; 65 and over, 703. The deaths from important causes were as follows: Consumption, 319; typhoid fever, 91; diphtheria, 57; scarlet fever, 11; measles, 1; whooping cough, 18; pneumonia, 267; diarrhœal diseases, under 5, 23; cerebrospinal meningitis, 14; influenza, 19; puerperal fever, 8; cancer, 96; violence, 120; smallpox, 17. The death rate in the cities during the month was 14.5, and in the country, 11.1.

Of smallpox there were 642 cases, with 17 deaths in 41 counties. Compared with the corresponding month last year, this is a decided increase, for in December, 1901, there were 465 cases, with 2 deaths, in 28 counties. This is an increase of 38 per cent. in number of cases, 46.4 per cent. in area invaded, and 75 per cent. in deaths.

LOUISIANA.—New Orleans, 305,000—81,500 colored. Report for December: Total deaths, 580—210 colored; 137 under 5 years —50 colored. Annual death rate, white, 19.86; colored, 30.92: 22.87. Deaths from typhoid fever, 13—4 colored; diphtheria and croup, 11; pneumonia, 43; tuberculosis of the lungs, white, 41; colored, 34; Bright's disease, 53—23 colored; cancer, 21—1 colored.

MASSACHUSETTS.—The thirty-third annual report of the State Board of Health, for the year 1901. In the routine work of the Board the year has been one of great activity: food and drug inspection, hearings on sewerage and sewage and water and ice and odors, examinations of rivers and water supplies, purification of sewage and water, stability of sewage effluents, lead poisoning from drinking water, meadows and rivers; sewer outlets, bacteriological studies, culture examinations for diphtheria and tuberculosis, blood examinations for typhoid fever and malaria, antitoxin production.

The death rate for the year was the lowest ever recorded, 16.82, with great prevalence, however, of scarlet fever, diphtheria, cholera infantum and smallpox.—The 778 cases, with 101 deaths, from smallpox, due to neglect of vaccination, naturally emphasize the board's recommendation of State control of vaccine virus. The typhoid fever rate, .195 per thousand, maintains the steadily diminishing mortality. The consumption rate, 1.75 from 4.27 per thousand in 1853, doubtless reflects the result of better sanitary measures, together with improved registration of causes of death.

The one hundred and fifty pages devoted to the subjects of "Advice to Cities and Towns" and "Health of Towns" are full of interest, especially to boards of health and health officers, and they show a marked improvement in the character of the work which has been accomplished from year to year throughout the State.

The three hundred pages devoted to the broad questions affecting supplies of drinking water, including the examination of rivers

and water supplies and sewage, chemically and bacteriologically, and the purification of sewage and waters, together with the same questions as treated in previous reports, have made the board a standard authority on these subjects at home and abroad.

In the inspection of milk, 6,109 samples were examined during the year, of which 4,372 were above standard and 1,737 below. Fifteen were colored with annatto, 31 with aniline orange; 42 were preserved with formaldehyde, 12 with boric acid. Of 116 samples of butter examined, 2 oleomargarine and 5 renovated were sold as genuine butter. One of 49 samples of cheese contained boric acid. Thirty-four of 73 samples of cocoa and chocolate were adulterated, chiefly with starch, the names of the manufacturers being given. Ten samples of coffee were adulterated, out of 143, with peas, wheat or chicory. The high price of apples made cider vinegar largely not what it purported to be.

Of foods other than milk, 2,530 samples were examined during the year, and of drugs 468.

In the seven years of the board's production of diphtheria antitoxin, 147,699 bottles of antitoxin have been issued, and with most gratifying results, as shown by the board's analysis of the mortality from diphtheria in the State for three years, which proves conclusively the importance of the earliest possible administration of antitoxin in the treatment of diphtheria. For the purposes of diagnosis and release from quarantine 4,119 cultures were made.

For tuberculosis, 797 specimens were examined; for typhoid fever, 108; for malaria, 91. Great good comes from the voluntary reports of deaths each week from the cities and towns, the annual reports of local boards of health, the required immediate report to the State Board of cases of diseases dangerous to the public health, and from the annual reports made under the law that in each city and town having a population of more than 5,000, as determined by the last census, at least one member of said board shall be a physician, and the board shall send an annual report of the deaths in such town to the State Board of Health in such form as shall be prescribed by the board. The board's use of the information gathered from these several sources is practical and important, and may in time lead to that general recognition of the value of vital statistics which we need.

Twelve new acts of the Legislature are recorded in regard to matters affecting the public health.

The examination required by an act of the Legislature of 1901 has shown some interesting results with regard to the danger

from eating uncooked shellfish taken near sewer outlets, as the colon bacillus was found in such in repeated instances. The investigation is still in progress.

MICHIGAN.—The Secretary of the State Board of Health reports for December, 1902, compared with the preceding month, influenza, pneumonia, scarlet fever, erysipelas, smallpox, measles and dysentery were more prevalent; and diphtheria, intermittent fever, cholera morbus and puerperal fever were less prevalent. Compared with the averages for December in the 10 years, 1892-1901, smallpox, measles and whooping cough were more than usually prevalent; and consumption, intermittent fever, remittent fever, dysentery and puerperal fever were less than usually prevalent. Of the most dangerous communicable diseases, *meningitis* was reported present at 10 places; *whooping cough* at 39 places; *measles* at 63 places; *typhoid fever* at 110 places; *diphtheria* at 113 places; *smallpox* at 126 places; *scarlet fever* at 177 places; and *consumption* at 239 places.—*Meningitis* reported present at 3 places more; *whooping cough* at 12 places more; *measles* at 15 places more; *typhoid fever* at 9 places less; *diphtheria* at 35 places more; *smallpox* at 85 places more; *scarlet fever* at 34 places more; and *consumption* at 1 place less, in the month of December, 1902, than in the preceding month.

Deaths reported during the month, 2,666, an increase of 309 over the preceding month. The death rate rose from 11.7 to 12.8 per 1,000 population, being slightly higher than the rate for December, 1901, which was 12.6. By age periods, there were 463 deaths of infants under 1 year; 166 deaths of children aged from 1 to 4 years, inclusive; and 850 deaths of persons over 65 years of age.

Important causes of death were as follows: Tuberculosis of lungs, 165; other forms of tuberculosis, 29; typhoid fever, 59; diphtheria and croup, 68; scarlet fever, 16; measles, 11; smallpox, 5; whooping cough, 23; pneumonia, 291; meningitis, 26; influenza, 35; cancer, 122; accidents and violence, 173.

NEW JERSEY.—Hudson County (Jersey City and environs), 409,810. Report for November, 1902: Deaths, 581—163 under five years; death rate, 17.0; deaths from diphtheria and croup, 20; typhoid fever, 2; all zymotic diseases, 55; consumption, 71; bronchitis, 18; pneumonia, 74.

Newark, 266,000. Report for the week ending January 10. Deaths, 104—31 under 5 years; death rate, 20.33. Deaths from

diphtheria and croup, 4; scarlet fever, 3; phthisis, 4; bronchitis, 5; broncho-pneumonia, 3; pneumonia, 5; cancer, 1. Contagious and infectious diseases reported: diphtherian-croup, 24; scarlet fever, 32; typhoid fever, 7; smallpox, 1.

NORTH CAROLINA.—Bulletin of State Board reports for November, 1902: Twenty-five towns with an aggregate population of white, 80,400; colored, 57,550: 137,950. Aggregate deaths, 230—126 colored; 87 under five years of age; still born, 18. Death rates, white, 15.5; colored, 26.3: 20.0.

Deaths from typhoid fever, 11; malarial fever, 14; consumption, 13; diarrhœal diseases, 23; smallpox reported in nineteen counties, an aggregate of 394 cases, no deaths.

OHIO.—Cleveland, 400,000. Report for December, 1902: Deaths, 548—65 under 5 years; annual death rate, 16.44. Deaths from typhoid fever, 8; smallpox, 15; diphtheria and croup, 38; tuberculosis of lungs, 52; bronchitis, 18; pneumonia, 48; heart diseases, 31; cancer, 16.

PENNSYLVANIA.—Philadelphia, 1,349,712. Report for week ended January 3, 1903: Deaths, 532—130 under five years. Deaths from consumption, 65; typhoid fever, 10; diphtheria and croup, 13; whooping cough, 4; smallpox, 1; cancer, 18.

Pittsburg, 346,000. Report of the Bureau of Health for week ended January 3, 1903: Deaths, 175—61 under five years; annual death rate, 26.04. Deaths from typhoid fever, 5; smallpox, 7; consumption, 12; pneumonia, 25; cancer, 2.

Cases of infectious diseases reported: Smallpox, 16; diphtheria and croup, 24; scarlet fever, 8; typhoid fever, 57.

CUBA.—Havana, 275,000—73,000 colored. The Chief Sanitary Officer reports for November, 1902: Total mortality, 418—114 under five years. Annual death rate, 18.48. Deaths from typhoid fever, 5; tetanus, 8; intermittent fever, 2; tuberculosis of lungs, 78; cancer, 19. Havana and the rest of the island continue to be free from yellow fever and smallpox.

THE PLAGUE PANDEMIC.

The Local Government Board has published a thick volume of reports and papers on bubonic plague by Dr. R. Bruce Low. During the three years dealt with in Dr. Low's report, plague has

become widespread, and has extended to every continent. Not until the wave has once more receded and opportunity has been thus afforded for weighing all the facts now being accumulated throughout the world can the epidemiologic, administrative, or other lessons to be learned from it be summarized. The records to which Dr. Low has had access, though they go to confirm belief that as regards plague man and the rat are reciprocally infective, do not afford sufficient data for determining the degree to which man is in danger through the rat. So far as the plague ashore is concerned, it appears that in some localities man and the rat suffered from plague coincidently; that in others man suffered before the rat; and that in others the rat suffered before man. When in a particular district the one (man or the rat) has suffered plague antecedently to the other, the interval between invasion of the first and of the second species has been often variable, extending sometimes over weeks and months. Plague may prevail largely among men without rats becoming conspicuously affected, and conversely, the disease may cause large mortality among rats of a locality while exempting man. As regards plague on shipboard, similar facts were forthcoming. The disease does not, under conditions of sea transit, appear to be at all readily conveyed from the rat to man or from man to the rat.

Since the autumn of 1896 plague has been epidemic in India. Official reports fall far short of the actual mortality, but it is known that during the period from September, 1896, to the end of June, 1901, there were 659,864 attacks and 525,401 deaths in the population, which in 1891 was 287,317,048. Cholera is regarded with far less fear than plague, though the ravages of the former disease far exceed those of the latter. The total deaths recorded from cholera for the years 1896, 1897, 1898, 1899 and 1900, were 2,148,149, while those from plague were 403,671.

CANCER VICTIMS INCREASING.

While the death rate of London during the last ten years has declined from 21 per 1,000 to 17.1, and the deaths from consumption in a corresponding ratio, the number of deaths from cancer has greatly increased. In 1901 this disease claimed 3,982 victims, being at the rate of .93, as compared with .78 in 1891, and .42 in 1851-60. The age at which cancer most affects people is indicated by the fact that 398 died at the age of 35 to 45, 891 between 45 and 55, 1,124 between 55 and 65, 928 between 65 and 75, and 394 between 75 and 85.

The report shows that an act for the cleaning of persons, which evoked much humor in Parliament under the title of the Verminous Persons bill, has met with unexpected success in Marylebone, where 3,967 males and 135 females were cleansed within the year and their clothes disinfected.

The medical officer urges the desirability of inculcating in the young the habit of bathing, and recommends the system adopted in Norway, Germany and Denmark, where spray baths are provided in connection with schools.

DECREASE IN THE POPULATION OF IRELAND.

The report of the Census Commissioners relating to Ireland shows that the population in 1901, including the members of the naval and military service in the country, was 4,458,775—2,200,400 males and 2,258,735 females; in 1891 it was 4,704,750—2,218,953 males and 2,385,796 females. There was, therefore, in the ten years a decrease of 245,975 persons, or 5.23 per cent. The only county in which an increase of population took place was Dublin, with 6.3 per cent. There is a marked diminution, amounting to 12.2 per cent., in the number of children and young persons under 20 years of age in 1901, as compared with 1891. The emigrants from Ireland numbered during the last decade 430,993—200,125 males and 230,868 females; in the previous decade the emigrants amounted to 768,105. The total for the past fifty years is 3,846,395, and 71.5 per cent. were between the ages of 20 and 45; 89 per cent. of the total go to America, and 6 per cent. to Great Britain.

INCREDULITY DUMBFOUNDED.

In an address some time ago, the late Dr. George P. Hays told a story of an old German in Pennsylvania who, meeting a young infidel who was to speak at the schoolhouse in the evening, said: "Is you de young man vot iss to schpeak dis ebening?" "Yes, sir, I am." "Vell, vot you schpeak aboudt?" "My subject, sir, is this: 'Resolved, That I will never believe anything that I do not understand.'" "Oh, my! is dot id? Vell, now, you shoost dake von leedle egg-sample. Der, you see dot field, my pasture ober dere? Now, my horse he eat der grass and it comes up all hair ober hees pack. Den my sheep he eat shoost der same grass, and id grows vool all ober him. Und now, vot you dink? My goose he eat der grass too, und sure's I dell you, it comes up all ober him fedders. You understand dot? do you? Heigh!—*The Bible Advocate.*

CONTEMPORARY LITERATURE.

THE OUTLOOK.

The January Magazine Number of "The Outlook" contains some six or eight illustrated articles, besides full-page portraits, poems, a story and the usual very full editorial treatment of current history and literature. Among the illustrated articles are: "In Delhi," by W. F. Dix, a talk about the great Indian city where in January was held the imperial "durbar" or proclamation of Edward VII. as Emperor of India, truly a magnificent spectacle; the Hon. John D. Long contributes the third in his series of articles on "The New American Navy," called "The Organization and Education of the Navy," and the article is illustrated with an original drawing by Henry Reuterdahl and portraits; and portraits and sketches of the new French ambassador, M. Jusserand, of Mr. Strachey, editor and proprietor of the London "Spectator," who is visiting this country, and of Mr. Cannon, who will almost certainly be the Speaker of the next House of Representatives. Mr. Augustine Birrell, the author of that most charming book, "Obiter Dicta," writes not only instructively, but with decidedly entertaining anecdotes about the history of the Bodleian Library at Oxford, which has just celebrated its three-hundredth anniversary; Mr. James Barnes, the author of several naval histories and stories, tells a strange chapter of United States history under the title, "The Tragedy of the Lost Commission," with quaint illustration; "The Italian Immigrant in America" is a subject treated with special knowledge and wide human interest by Mr. W. E. Davenport, while the types of the Italians are shown by really fine photographs; a winter article, with strikingly beautiful pictures, is contributed by Mr. Oscar von Engeln.

DEMOCRACY? THEN, NO SERVANT CLASS!

"People who have been brought up in households where there is an organized underworld of servants, are incurably different in their social outlook from those who have passed a servantless childhood. They *never* quite emancipate themselves from the conception of an essential class difference, of a class of beings inferior to themselves. They may theorize about equality, but theory is not belief. They will do a hundred things to servants

that between equals would be, for various reasons, impossible. . . Sincere, real democracy and a servant class are incompatible things; of that I am exceptionally certain. The Englishwoman and the Anglicized American woman of the more pretentious classes honestly regard a servant as physically, morally and intellectually different from themselves, capable of things that would be incredibly arduous to a lady, capable of things that would be incredibly disgraceful, under obligations of conduct no lady observes, incapable of the refinement to which every lady pretends. It is, to me, one of the most amazing aspects of contemporary life, to sit and converse with some smart, affected, profoundly uneducated, flirtatious woman, about her housemaid's followers. There is such an identity; there is such an abyss."—H. G. Wells, in the January "Cosmopolitan."

"THE BETTER WAY AS TO LABOR."

In citing specific instances of good feeling between workmen and employers, the editor of the "Century," in the January number, writes thus:

"We wish to call attention to another principle involved in the labor question, namely, that the workingman is entitled to something more than his 'wage'; that the law of supply and demand, though it inevitably is felt in the so-called 'labor-market,' is not the only law to be obeyed; that something more, even, than fair-dealing, namely, human sympathy, is to be exercised by the employer; and, by the same principle, that the workingman should reciprocate this sentiment of consideration and sympathy.

"It is not difficult to gather together incidents showing the excesses—the crimes—of zeal on the part of unionism. Such arraignments are extremely useful, for they show to the honest and thoughtful components of the labor element, and they exhibit to the community at large, the extreme danger of certain tendencies. But it is also of great use, as it is a much pleasanter task, to contemplate from time to time the other side of the picture and to name instances where right feeling and right treatment on the part of employers have been met by right feeling and manly behavior on the part of the employed.

* * *

"A fresh, and in some of its details picturesque, instance of the right relation between employer and employed occurred at the time of the recent election in Pennsylvania, a highly gratifying accompaniment of which was the overthrow of the reigning po-

litical machine in Pittsburg by a combination of men of character and independence in both of the great parties.

* * *

"A day or two after the election, when the successful candidate entered his shop, he was surprised by a loud welcome of ringing steel, surrounded by a sea of joyful faces, and forced to mount a platform and receive and make addresses from and to five hundred or more of his present and former employes!"

THE most complete statement of the Venezuelan case from the points of view of the several interested parties that has yet been made appears in the "Review of Reviews" for January. This résumé of the situation is contributed by Mr. A. Maurice Low. The reasons for arbitration are succinctly set forth by the editor in "The Progress of the World."

GAS LEAKAGE.

Dr. Lederle, the President of the New York Board of Health, is rapidly making a name for himself by his energy in studying the public good in his own province. Recently, he determined to see, if possible, how far, and in what way, leakage of gas into the cellars of houses through defective pipes affected the health of the occupants of such houses. In the course of his investigations, his attention was directed to a gas main, two and one-half inches in diameter, in a single length of which, fifteen feet long, there were twenty holes. Naturally, the gas escapes in enormous quantities from such mains as this, and a large part of it finds its way, usually, into the neighboring cellars, the walls of which are often as permeable as the pavement over the pipes. Another way in which gas is said to be brought into buildings is through pneumatic tubes, which are often placed in the same trench, or conduit, with gas mains, and draw in gas from the leaks in the latter, to discharge it into the rooms served by the tubes. As pneumatic tubes, to be operated successfully, must be at least nearly airtight, it is difficult to see how gas could be drawn into them except from a source practically saturated; and the infection of cellars around such a spot would be likely to be much more serious than that carried through the pneumatic tubes. Dr. Lederle is said to be trying to trace an apparent connection between the infection of houses from leaky gas mains, and the occurrence of typhoid fever

in the same houses. Of course, no one would expect to find the typhoid bacillus in gas, but the typhoid germ does not usually propagate itself in persons in full health and vigor, and it is very possible that the breathing of air contaminated with small quantities of gas may produce such a depression of vitality as to expose the system to bacterial influences.—*American Architect.*

AMERICAN CONCERN FOR THE CHILDREN.

"The greatest underlying task of the people of any civilized and self-governing country is the transmission of its best wisdom to the rising generation. Our destiny as a nation is bound up with the question of education. We have perhaps never in our history had a year in which so much valuable effort has been made in the educational field. The public schools are improving their methods, and public and private money is being expended as never before—not merely to prevent the growth of illiteracy, but to make education practical and useful, and to make the individual an efficient worker and a good citizen. In the South especially there has been a renewal of effort along educational lines, and this is due in considerable part to the work of certain new educational boards, which have found not merely generous financial backing, but—what is equally necessary—wise methods of obtaining the maximum of educational results with a minimum of expenditure. The growth of cotton mills and other industries in the South, while making for general progress, has involved some incidental evils, such as the considerable employment of child labor. This will sooner or later be ended by the application of such factory acts as exist in England and in our Northern States. Meanwhile, it is much to be regretted that New England capitalists, who largely own these Southern mills, are to some extent engaged in thwarting the efforts of humane Southern people in their endeavors to secure proper legislation on this subject. The important thing to note is the splendid determination and spirit of the movement which is opposing child labor, and which is certain to win its cause in the near future. We have such questions in one form or another always with us, and eternal vigilance is the price of continued progress. It is reassuring, therefore, to note, upon the whole, that there is a steady improvement in social conditions in this and in other regards. Child labor laws need revision and better enforcement in Pennsylvania and New York."—From "The Progress of the World," in the "American Monthly Review of Reviews" for January.

"To THE WOMAN IN OPERA the preservation of health is the first requisite. Even the actress may appear when she is ill or occasionally slight her work and leave the public little the wiser, but the opera singer who is not in good voice suffers a distinct impairment of professional reputation. The care which a prima donna exercises to secure immunity from ills would astound the uninitiated. Athletics is considered a prime requisite. Madame Sembrich aims to walk for two hours every day, and other prominent singers are equally energetic."—Waldon Fawcett, from "The Road to Opera," February "Delineator."

REFINED ENTERTAINMENTS.

That Mr. Proctor's theatres are adapted for all kinds of refined entertainment was clearly demonstrated at Albany, N. Y., last week, when Henrietta Crosman played an engagement of one week in "The Sword of the King." Miss Crosman was unable, through the large theatrical syndicate, to obtain a week in Albany. However, through Mr. Proctor's personal friendship for Miss Crosman, he allowed her to interrupt a very successful vaudeville season, and entirely changed the policy of his house for the time. Ordinarily the prices at the Albany house run from 50 cents to $1.00. These prices were raised to $2.50. Miss Crosman's business at Albany ran over $9,000 on the week. This one venture has encouraged Mr. Proctor to "try again," and no doubt several engagements of prominent attractions will be interspersed during the season of vaudeville.

Within a few weeks a splendid production of "Camille" will be given at Proctor's Fifth Avenue. It has long been Minnie Seligman's desire to play the title rôle in this famous drama, but she has never been in the position before where she felt that a proper production would be made for her. With this state of affairs in view, Mr. Proctor has determined to make a special production, with all new scenery and electrical embellishments. Miss Seligman has for some weeks past devoted much time to the study of Dumas' famous character, and a splendid performance is promised.

A HINT FOR YOUNG READERS.

"So many excellent portraits of authors and pictures relating to them are now published in journals and periodicals that it is easy to add to the value of your books by inserting not only the portraits of the writers, but views of their homes, their libraries, and also of scenes told about in the books themselves."—From "Books and Reading," in January "St. Nicholas."

BULLETINS, REPRINTS, ETC., RECEIVED.

Experiment on the Effect of Muscular Work Upon the Digestibility of Food and the Metabolism of Nitrogen, by Chas. E. Wait, Ph.D., F. C. S. Bul. 117, U. S. Dep't Agriculture, Washington, D. C.

Laboratory Course in Pathology and Bacteriology, by M. J. Rosenau, Director of Hygienic Laboratory. Bul. 8, Public Health and Marine Hospital Service, Washington, D. C.

Laboratory Technique. Ring Test for Indol, S. B. Grubs and Edward Francis.

Microphotography with Simple Apparatus, H. B. Parker—M. J. Rosenau, P. A. Surgeon, Director Hygiene Laboratory, Bul. 7, Public Health and Marine Hospital Service, Washington, D. C.

The Legal Aspect of Water Pollution, J. L. Leal, M. D., Paterson, N. J.

Typhoid Fever from Sources Other Than Water Supply, M. A. Veeder, M. D., Lyons, N. Y.

The Michigan Medical Society. Presidential Address, Leartus Connor, M. D., Detroit, Mich.

X-Rays as a Therapeutic Agent, A. V. L. Brokaw, M. D., St. Louis, Mo.

Consumption Contracted in Colorado and Methods to Restrict Its Spread, G. G. Bonney, M. D., Denver, Col.

The Care and Treatment of the Insane—A Medical Question? Abstract from State Lunacy Commission Report.

Formaldehyde Disinfection in a Vacuum Chamber, P. A. Surgeon E. K. Sprague, U. S. M. H. S., Hygiene Laboratory, Washington, D. C.

Open-Air Treatment of Tuberculosis: Tent Life in Arizona, R. W. Craig, M. D., Phœnix, Ariz.

The Dispensary or Home Treatment of Tuberculosis, John F. Russel, M. D., New York.

Fear as an Element of Nervous Disease and Its Treatment, John Puntow, M. D., Kansas City, Mo.

The Treatment of Pulmonary Maladies in Favorable Climates, Earl S. Bullock, M. D., Silver City, N. M.

Radiotherapy for Cancer and Other Diseases, William F. Morton, M. D., New York.

Orleans Parish Medical Society Proceedings, June-July, 1902.

Pathological and Bacteriological Laboratory, Delaware State Board of Health, Newark, Del.

SANITARY SCIENCE.

A SYNOPSIS OF SANITARY SCIENCE AS REPRESENTED IN THE SANITARIAN, ALPHABETICALLY.*

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DUST AND DISEASE.

By A. N. BELL, A. M., M. D.

"As we approach the great centers of population," says *La Nature,* "the quantity of dust held in suspension by the air increases enormously. According to Sir James Crichton-Browne . . . the air of London contains 150,000 proportional parts of dust to Paris's 210,000, while in Argyleshire, Scotland, there are only 200. The air of cities is impregnated with dust and filth. To combat their deleterious effects, the streets should be freely ventilated and watered. Wind and rain are the great destroyers of dust, and they should be given a large field of action by isolating houses, enlarging streets, placing a limit on the height of buildings, etc."

The substances designated as "variable" in the composition of the atmosphere* are but feebly suggestive. For even the sources of the variable substances are so manifold as to be difficult of enumeration; while the various substances designated as "dust" are so diverse and manifold as to be insusceptible of classification.

From the fields, the wind lifts the debris of vegetation, pollen, seeds, spores of fungi and bacteria; the dust of the soil, silica, silicate of aluminum, carbonate and phosphate of lime and peroxide of iron. In and proceeding from volcanic regions fine particles of carbon and dried mud are taken up and wafted hundreds or even thousands of miles. In and roundabout cities and towns, the finely ground dust of the pavements, fragments of straw, hair, stable manure, debris of insects, soot; epithelia from floor sweepings or shaken from rugs, carpets and bedding; together with gases and other volatile emanations from factories, rendering establishments, abattoirs, tanyards and compost heaps of all sorts, though not of the air are in it, insomuch as to be in some degree almost everywhere present.

*Air and Its Properties as Related to Health.—January number.

Dr. John McGaw Woodbury, Commissioner of the Department of Street Cleaning, gave an admirable lesson to the public a few months ago by directing attention to the comparative prevalence of bacteria in the air of various streets and at different heights above the pavement, for the connection between disease and germ-ridden dust is a close one and one constantly in action in large cities. But dust *per se,* quite apart from any contamination with pathogenic micro-organisms, is something with which we must reckon in seeking to extend our knowledge of the causes of disease and to combat its prevalence. This was quite graphically brought out by Sir James Crichton-Browne, in the address above referred to, entitled "The Dust Problem," delivered before the Section in Sanitary Science and Preventive Medicine of the Sanitary Institute Congress held in Manchester, England, last September. After reciting many analyses of the air of various altitudes and localities, and its relation to occupations, he says in conclusion:

"We must realize that in towns the quantity of mineral and organic dust in the air must greatly depend on the way in which scavengering and street-watering are conducted, and we must insist that cleansing shall be thorough, and that dust is not only 'moved on' but removed altogether.

"Domestic dust is in the inverse ratio of domestic cleanliness. In my young days in the country a speck of dust on any article of furniture was an opprobrium on the moral character of the housewife. Nowadays, in towns at any rate, it may be an inch thick without reflecting any discredit on her, and domestic dust in our large towns is really an atrocious compound. I collected some of it from the top of a wardrobe in the sick-room of a lady in the West End of London a short time ago. The room was dusted daily, and had been thoroughly cleaned out and whitewashed three months previously, and yet the dust lay on the top of the wardrobe 1-12th of an inch thick. In a test tube it is not unlike basic slag dust. It is of the same color, but it is, of course, much lighter, and more flocculent. To analysis it yields the following results:

Moisture	4.4
Organic matter	52.6
Silica and insoluble silicates	21.0
Oxide of iron and albumina	9.7
Lime (CaO)	6.2
Carbonic acid with traces of sulphuric and phosphuric acid	6.1
	100.0

"Under the microscope the dust is seen to consist of inorganic and organic material. The inorganic matter is mostly amorphous, while the organic is for the most part organized.

"Among the commonest constituents are vegetables and animal fibres derived from fabrics, such as linen, cotton, and wool; something resembling jute fibre is also seen. In addition there are a few feather barbs and fragments of wood.

"Among the most interesting constituents are squamous epithelial cells from the skin and small round cells, both of which are fairly numerous. Food materials are represented by starch granules, and there are certain organized vegetable materials among which a few pollen spores can be identified.

"This dust would make an excellent manure, but as an article of toilet it is scarcely to be recommended.

"To some extent domestic dust is inevitable, but still we must struggle against it, and bear in on our people a sense of the dangers that attend it, for it is dangerous. It smothers, not as suddenly, but in the long run often as effectively as Desdemona's pillow. The open window, even when it lets in dust, supplies at the same time its best antidote in fresh air; the archaic practice of scattering damp tea leaves or some equivalent when sweeping the floor is worthy of revival, and the prompt and frequent removal from the house and its precincts of all collections of dust is a universal hygienic obligation. Puck sang:

> 'I am sent with broom before,
> 'To sweep the dust behind the door.'

But that will not do; the dust must not be left behind the door, or even in the dust-bin, but must be conveyed to the destructor without delay."

Affections of the respiratory organs, particularly summer catarrhs and bronchitis, have been long recognized as justly attributable to the dust of the fields and pollens of the grasses; the spores of certain fungi in the air cause skin diseases; influenza is doubtless communicated in the same way; and most fatal of all, tubercular consumption, by the dust of dried sputum.

But dust in the air is alike dangerous to the digestive organs as to the respiratory; particularly in cities where the market supplies of all kinds are exposed to the dust of the streets and of the brush and broom of the shops. Intestinal disorders attributed to fresh and otherwise wholesome fruits and vegetables, are frequently due to this exposure.

Evidently dust in the air of the streets is in a great degree preventable by palpable means, and that so far, it should be prevented. That food should not be exposed; that it should be covered or otherwise protected; that it should be thoroughly brushed or wiped—which is better than washing for such sorts as will admit of it—or washed, before eating, and all sorts of fruits and vegetables that are to be cooked, which have been exposed, should be thoroughly washed in pure water before cooking, for even cooked impurities are unwholesome.

The ill effects of mineral dust, and dust from fabrics, flock-dressers, paper-makers, feather-dressers, shoddy-grinders, weavers, wire-grinders, masons, file-cutters, button-makers and various other works were very clearly shown by Sir John Simon's report on the air of coal-mines, forty years ago: Such air, "besides being chemically insufficient for respiration, also carries with it into the miner's lungs more or less irritant material, matter which though the air were ever so well oxygenated, would itself tend to produce bronchitis, namely soot, grit and the acid fumes of combustion." He further goes on to show that at that time, with one exception, the miners in England as a class broke down prematurely from bronchitis and pneumonia, caused by the atmosphere in which they lived and worked. The one exception which he cited was in mines *exceptionally well ventilated.* Owing to sanitary legislation brought about by that and other efforts, ventilation has been very generally effected in the mines of England, and statistics show that consumption is no longer an excessively common disease among the miners.

Consumption and other respiratory diseases are common among workers in wool, cotton, flax and shoddy; in cotton factories, the dust contains china-clay from the "sizing," as well as cotton fibre. Tailors, drapers and hairdressers are also super-subject to lung diseases, probably on account of the inhalation of dust.

Sharp, angular, mineral particles are more injurious than other kinds of dust, insomuch that metal miners and workers in England die by lung diseases in a proportion nine times greater than the agricultural population.

Some other metallic impurities in the air are directly poisonous. Of such are zinc fumes (oxide of zinc), given off in brass foundries, and cause a disease which is known as "brass founder's ague," the attacks of which present a cold stage with rigors, a stage of febrile reaction, and a stage of profuse sweating. It differs from true ague in not being periodic. Copper works are

liable to produce arsenical fumes and, consequently, arsenical poisoning.

Mercurial fumes, or dust, are sometimes responsible for the symptoms of mercurial poisoning, to which "water-gilders," mirror-silverers and other workers of mercury are liable. Besides the ordinary symptoms, salivation, alimentary disturbances, and mal-nutrition, there are tremors of the hands and arms, with pain in the joints; and in aggravated cases the tremors and movements become violent and general; but as a rule, they cease when the patient is recumbent and still.

The makers of matches exposed to the fumes of phosphorus, until a few years ago, frequently suffered from necroses of the jaw bones. During recent years, however, this effect seems to have been obviated by the use of *amorphous* or *red* phosphorus, which is said to be harmless, and therefore should be exclusively used for this purpose.

In making bichromate of potash, the heat evolves vapor which, together with fine particles evolved, on contact with the nostrils and throat cause irritation, and finally ulceration and great irritation of the mucous membrane, and ultimately, ulcerations extending to and of the bones of the nose, yet its effect is not noticed to reach the lungs.

As a preventive of this irritation tobacco-snuff is recommended; those who use it escape. Irritation of the skin is also common among the workers in this salt, sometimes amounting to pustulous sores. Against this, and as a curative if properly used on the occurrence of the first symptoms, washing the skin of the hands and arms with a solution of the subacetate of lead is efficacious. The mouth of such workers escapes irritation, because the particles which reach it are dissolved in the saliva which is antidotal.

The severity of the effects of mineral dust generally appears to depend more upon the amount of dust in the physical condition of it, as to roughness and quality of smoothness of the particles, than on the nature of the substance. Nevertheless, the quantity is so great among those engaged in cement, pottery, china, button, tool works, etc., and in some textile factories, as to induce exceedingly grave and usually fatal diseases of the lungs, as asthma, circumscribed inflammation, abcesses and hemoptysis, "fibroid" phthisis and special predisposition to tuberculosis.

Preventive measures against the particulate dust of workshops

and factories generally are palpable, but not always practicable; ventilation, careful spraying and respirators are tangible means, more or less effective. Female workers usually depend upon gauze veils and flap-hoods; and the males, for extraordinary occasions, depend upon extemporized respirators of cotton wool. To meet such conditions, twenty years ago, when flax-hackling and wool-combing were carried on in the Belfast mills mostly by hand, Dr. Mapother invented a very efficacious respirator, but few used it, because they were laughed at by their fellow-workers. Nevertheless, even now, as well as then, to the artisans of many trades and factories, who have more regard for their health than for the derision of their careless fellows, it is a commendable device. It consists of a wire gauze covering the mouth and nose, lined by a layer of cotton wool, quarter of an inch thick—if thicker it is uncomfortably warm. It is provided with a peg by which it is held on by the teeth.

Plumbers and painters and other workers with white lead, or in factories of it, are subject to lead poisoning, by inhalation, or by tainted food or water as a consequence of insufficient attention to cleanliness of the hands after work, before eating, and carelessness with regard to the exposure of drinking water to such conditions. The early symptoms are tightness of the chest and colic. Persistence is followed by weakness of the muscles of the forearm —"wrist drop"—and after a while a wasting of the muscles. A blue line is formed along the edge of the gums; eventually palsy, preceded by and accompanied with much pain in the limbs. As a preventive, the use of drinking water rendered pleasantly acid by the addition of "Elixir of Vitriol" (sulphuric acid) and a little sugar, is efficacious to a considerable extent; and commendable to all who cannot obviate the danger by cleanliness and ventilation.

In some of the processes of making steel, hydrochloric, sulphurous and nitrous acids, and chlorine are evolved, and cause eye disease, bronchitis, pneumonia and destruction of the lung tissue. Against this danger, ventilation appears to be the only remedy.

In vulcanized rubber factories, a noxious, but somewhat indefinable gas, supposed to be the vapor of carbon disulphide, is evolved. Those exposed to it suffer from headache, giddiness, nervous depression, sleeplessness, pains in the limbs and complete loss of appetite; sometimes, deafness, dyspnœa, cough, and febrile attacks. Ventilation is the particularly needful preventive.

MICRO-ORGANISMS IN THE AIR.

Of all the dust of the air, micro-organisms are doubtless the most dangerous to breathe. Micro-organisms, bacteria, microbes and germs which infest the air, are synonymous terms. They are almost wholly of vegetable form, but a few are of animal form. They were first distinctly described as "Organized Corpuscles in the Air" by Pasteur, forty years ago, but until only about thirty years ago were more generally regarded as the results of disease than the cause of it, which, as demonstrated by Dr. Robert Koch in 1872, is now accepted knowledge, but not of *all* bacteria.

Bacteria are unicellular organisms with a cellular wall and protoplasmic contents. They are among the most prolific of all living things. Reproduction takes place by fission or by the formation of *spores*. In the former method of multiplication one or more separations form in the mother cell, and so divide into two or more parts, or daughter cells, at first linked together, but ultimately they separate and thus each part becomes a new individual, which pursues the same process *ad infinitum*. Spores are round or oval, refractile bodies, which are formed in the interior bacterium, or mother cell, and at the expense of its protoplasm. The cell wall and the remains of the protoplasm quickly undergo a process of solution, and the spore is set free; and under favorable conditions, germinates and quickly produces a new individual having all the characteristics of the original cell from which it sprung.

Five years subsequent to Pasteur's discovery, in 1867, Sir Joseph (now Lord) Lister, already a distinguished surgeon, and having much hospital practice in Edinburgh, conceived the idea that the "organized corpuscles" in the air described by Pasteur, possibly held some relation to the excessive prevalence of pyæmia, erysipelas and hospital gangrene following operations and injuries; and, if so, these complications were preventable. Accordingly, he set to work, and by the use of antiseptic sprays and dressings, and subsequently, antisepticized instruments and filtration of the air of the operating room, he inaugurated the *sanitary* practice of surgery. Pyæmia, erysipelas and hospital gangrene, which hitherto had been common and frequently fatal results of surgical operations, almost ceased to occur. The practice is now everywhere followed by competent surgeons. Surgical operations, particularly in abdominal surgery, which, previous to the adoption of the preventive methods introduced by Lord Lister were considered impracticable, have since become common and

successful. Contemporaneously with Lord Lister's progress in demonstrating the benefit of sanitary measures for the prevention of the most dangerous complication of surgical practice by the exclusion or destruction of bacteria, Drs. John Snow, William Budd, Thorne Thorne, Profs. Frankland and Koch, Klebs, Eberth and others, were similarly engaged in investigating the causative relations of bacteria to cholera, typhoid fever and other intestinal diseases, attributed to the use of polluted water, and with such determinate results as to place their actuality beyond question.

Pathogenic bacteria, taken altogether, are indeed the chief antagonizing force to human life. Bacteria, for the most part, belong to an enormous family of vegetable organisms, whose office in the role of living things is, in general, beneficent, but as in the higher orders of vegetable organisms, some are poisonous, and these are the "pathogenic microbes"—*disease* germs. Of their life-history there is nothing known beyond their present aspect. No evolutionist has yet instituted inquiry into their primitive form—if they were ever of any other than as now observed—or ventured to anticipate their development into a higher order of living things in the future. Nor has there ever been discovered any division of their bodies into special organs, or any function beyond their self-multiplication by fission or sporification; that is, by division of each unit into two, and so on, indefinitely, resulting by geometrical progression in such an enormous increase of numbers in a very short space of time under favorable circumstances as to defy the power of imagination to comprehend. When we consider that an impure atmosphere is the most favorable condition for their propagation, and reflect upon the facility of their reproduction and marvelous distribution, we may well wonder how it is possible to escape them. Indeed, it is not possible. But from the scientific basis on which preventive medicine rests, we can fight them. And though we may not be able to wholly eradicate them, we can oppose them and restrict their ravages, and we can so cultivate our powers of resistance to them as by constant effort to defy them.

A colored gentleman beat rugs in a back yard, and the dust was distributed over the clean clothes in the next place. Magistrate Crane let the colored gentleman go free, because the law which forbids rugs to be so beaten did not specify where they might be cleaned. People who want to obey the law know that they can be cleaned in vacant lots, when the sun shines and devours the microbic dust, or in establishments maintained for the express purpose, where there is an air current that forces the dust through devouring furnace.

PREVENTABLE DISEASES IN THE STATE OF NEW YORK.

REPORT OF THE COMMITTEE ON HYGIENE OF THE STATE MEDICAL SOCIETY, 1903.

Your Committee on Hygiene has studied the various problems, the solution of which is of importance to the entire State, and presents the following report:

1. *Tuberculosis* continues to be the most prevalent of the infectious and preventable diseases, notwithstanding each successive year sees a slight diminution of the death rate from this scourge. The fact that the imperfect and inadequate methods thus far available for the limitation of this disease have given such results, should arouse the enthusiasm of every physician and every philanthropist, and should unite them in most vigorous efforts to push forward all well known and necessary measures for stopping the spread of this disease. In England during the last fifty years the diminution of deaths from tuberculosis has been 45 per cent. Dr. Hermann M. Biggs says in a recent article: "During the last twenty years there has been a reduction in the death rate from tuberculous diseases in New York City of nearly forty per cent." These figures indicate how responsive to even slightly improved conditions this disease is. If we place side by side with this improvement in a whole nation and in the greatest city in the United States, the figures printed by Bowditch, showing that in the Massachusetts State Sanatorium at Rutland 79 per cent. of the cases received in the first stage were "arrested," we can say boldly that of all infectious and communicable diseases tuberculosis is the most easily controlled. But the percentage of improvement leaves an appalling number who are yet victims of this disease. Biggs recently said that an expert diagnostician could doubtless find tuberculosis in 30,000 people in New York City to-day. In a recent publication it was shown that in New Hampshire, from 1884 to 1901, 40.72 per cent of all deaths between the ages of 20 and 30 were due to tuberculosis. It is because of this, and because this disease strikes down men and women in the most productive period of their lives, that your committee wishes to emphasize our duty to this largest class of unfortunates. We, therefore, recommend that persistent agitation of the duty of the com-

munity to the tubercular poor be infused with new enthusiasm. (*a*) The education of all the people in the fundamental principles of infection and of self-protection should be brought about through the general adoption of such measures as are in force in New York City. To reach the largest number of the people, industrial insurance companies and all sick benefit societies could be made use of for the distribution of literature with great promise. The senior students in every grammar school and high school should be required to pass an examination in the method of preventing the spread of tuberculosis. Societies for the Prevention of Tuberculosis should be organized in every community. Public lectures in each school district should be frequently given by one who understands the facts and has the gift of teaching them to minds of ordinary intelligence. By these educative efforts much could be done to teach the teachable the sanitary science of everyday living. The degenerates and irresponsible will have to be attended to directly by the administrative authorities, and compelled to conform their lives to methods that are not dangerous to their neighbors. (*b*) We note with alarm the efforts said to be making by the greedy to secure a repeal of the Tenement House Act, or to so modify it as to make it practically inoperative. Much of the improvement in the management of tuberculosis in the past has been due to a slowly attained improvement in the housing of the poorer classes. The argument that such a restrictive law for any but overcrowded sections is unnecessary is specious and fallacious. On the other hand, it is right that the most stringent regulations governing the building of tenements should be made to apply to all cities large enough to contain a single tenement or flat house. We, therefore, recommend that the influence of this great society be powerfully exerted to preserve all the good of the present law and to increase its humane provisions as rapidly as possible. (*c*) We recommend the compulsory registration in the proper office by every physician of every case of tuberculosis, and that in case of death the house be thoroughly disinfected by the proper health officers. (*d*) We recommend the opening of dispensaries for the treatment of the tuberculous poor, and that the attending physicians be instructed to seek out those whom they may learn are showing signs of beginning tuberculosis, though they may yet be at work. (*e*) We recommend the establishment in every city, or at the county seat, in parts of the State not thickly inhabited, a Receiving Hospital for Tuberculosis. This hospital should be erected by each community and be independent of the County Poor House. To it

should be sent every case of tuberculosis among the tubercular poor, and these cases should be sent at the earliest possible period of their disease. The cases here received should be under competent observation, and receive the most scientific treatment for a sufficient time to determine an accurate prognosis, when from them should be selected the most favorable cases, which should be sent to the State Sanatorium for Tubercular Poor, while those in whom the prognosis is less favorable be still given the scientific treatment. Such favorable cases need not all be incipient, for nothing is surer than that cases in almost any stage of the disease are curable under certain well ascertained conditions. Finally, we urge the State to prosecute, with great diligence, the building of the one hospital, for which an appropriation of $150,000 has been secured. On December 31, 1902, we had the pleasure of observing that the cellar had been commenced. When this hospital shall have been finished and put under the right management, and when it shall have been properly conducted for a single year, we predict that such results will have been attained that a legislature which willingly appropriates almost four million dollars annually for the housing and care of her insane and epileptics alone, unfortunates who seldom become self-supporting, though some of them may be discharged, will not fail to see that that larger class of more easily cured patients, and more menacing to the community, the tuberculous poor, are cared for in a way as intelligent and effective. Then legislators may have an object lesson which will illustrate the estimate of the Charity Organization Society, which is to the effect that "there is a total annual loss to the city (New York) from tubercular diseases of the poor of $23,000,000."

2. *Typhoid Fever* has not claimed as many victims in the past year as in years previous. This is apparently due to a diminished influx of infected individuals rather than to any marked improvement in the care of water supplies. Attention has been effectively drawn to other carriers than water of the infectious principle in a paper by Dr. M. A. Veeder, of our Committee, which has attracted the attention of all sanitarians. In Circular No. 62 from the Adjutant General's office, on "Typhoid Contagion and the Means of Preventing It," issued December 26, 1902, most careful orders have been issued to all army posts which, if carried out, will make impossible such another sacrifice of the lives of the soldiers from this disease as disgraced our army in the Spanish-American war. In a paper read before the Syracuse Academy of Medicine, Dr. R. H. Hutchings, Acting Superintendent of the State Hospital at

Ogdensburg, traced an epidemic of typhoid in that institution to infected ice cut in a bay of the St. Lawrence River, and he demonstrated that the bacilli, after imprisonment in ice for seven months, were active and capable of cultivation on culture media. This brilliant demonstration has established the fact that the bacillus typhosus is viable and virulent after imprisonment in ice for a period much longer than has ever before been regarded as possible. It has been reported that the waters of the larger lakes in the Adirondacks have become polluted with typhoid dejecta, and attention is called to this as a new source of danger. In view of these facts your committee recommends that it be made imperative that all dejecta from typhoid patients be thoroughly disinfected before they are disposed of in any way whatsoever.

3. *Smallpox* has gradually increased during the past ten years, and during the last year has been more prevalent than ever. Through the opposition of unscientific sentimentalists persistently kept up in several widely circulated journals, valuable for some of their literary and artistic features, and through the revolt of many people against subjecting themselves to septic wounds, which have been the result of unscientific methods of slovenly physicians, the value of vaccination has been more and more called into question, until in many communities a generation of unvaccinated people has grown up. If the world has not been convinced of the efficacy of vaccination against smallpox, it cannot be convinced of the truthfulness of any scientific deduction, nor of any mathematical demonstration. Argument will no longer avail and is undesirable. In a report of the Health Officer of Rochester to this committee it is apparent that the epidemic in that city during the past six months has had for its victims only those who have never been vaccinated, or those in whom the immunity conferred has run out in the changes attending the establishment of puberty. The exceptions to this rule are so very few in the history of all recent epidemics everywhere that they but accentuate the general truth of the proposition. To have an epidemic of smallpox in the first years of the twentieth century is a disgrace to our boasted civilization, and is an unpleasant commentary on the work of physicians. Your committee would direct attention to the necessity of strengthening the existing laws, making vaccination compulsory in childhood, and again after the establishment of puberty, and urge the conscientious enforcement of this law by the health officers of every community.

4. *Scarlet Fever* has been endemic and epidemic in all portions

of our State for many years. The cases have hitherto been light, and there has been a laxity in carrying out the provisions of quarantine. Your committee has received the report of an epidemic of virulent scarlet fever in Amsterdam, in which city there have been forty deaths from this disease in the last three months. Recent cases in Albany and Syracuse have assumed a virulent form. This serves to call attention to the possibility of a change in the virulence of this disease throughout the State, as has been observed many times in the history of this and other epidemic diseases. We, therefore, recommend that unusual watchfulness be observed by health officers and attending physicians, and that a quarantine for at least six weeks be strictly maintained, until every manifestation of the disease has ceased, however light it may appear to be.

5. *Cancer.*—The increasing prevalence of cancer and the present unsatisfactory state of our knowledge concerning the etiology of this disease cause us to recommend that the State appropriation for the laboratory investigation of this disease be continued.

6. *Impure Milk.*—The problem of how to obtain a supply of wholesome milk for large cities is still one of the most serious proportions. The natural difficulties of obtaining from a hairy animal kept under artificial conditions of life a secretion that will be free from injurious elements are and always must be very great. Fortunately, we believe, the latest dictum of Koch, that bovine tuberculosis is not transferable to man, has made no impression upon the laws regulating the production of milk. With the accumulated evidence against his proposition, it is clear that we must insist upon the rigorous enforcement of all our laws made for stamping out bovine tuberculosis. So long as there is a shadow of a question of the accuracy of his deductions, it would be criminal for us to jeopardize the life of a single infant by permitting the use of milk from a tuberculous cow. In the London Congress of Tuberculosis it was shown that while the general death rate in England from tubercular diseases had in fifty years diminished 45 per cent., the death rate from abdominal tuberculosis in infants had increased 27 per cent., and that no attention had been given to improving the condition of the milch cows. The success of the Medical Society of the County of New York in improving the milk supply by certifying the milk of approved dairies has been attended with such remarkably good results that your committee recommends that the subject be taken up in every County Society and in all societies affiliating with this organiza-

tion, and that each carry out the plan now successfully operated by the Society of the County of New York, in collaboration with Boards of Health.

7. *Incompetency of Health Officers.*—Finally, your committee feels that the present imperfect condition of Sanitary Science in our country is largely due to the fact that health officers are too frequently appointed for political reasons rather than because of their peculiar fitness for the positions which they occupy. In almost no medical school of our State or in the country is there more the most superficial teaching in State Medicine, and no incentive is held out to men entering the medical profession to devote their lives to this most important field of labor. We may well take lesson from some of our older sister nations, and now, when we are just becoming recognized as a world power in finance and diplomacy, we may well consider whether it is not right that we should elevate the plane of preventive medicine. The contributions of American medical men have not been inconsiderable. The achievements of the Medical Department of the Army in banishing yellow fever and cholera from our insular possessions should but be added incentive to the performance of great work in all departments of State medicine. Since 1866 England has had a law making it necessary for every man occupying the position of health officer to a community to have a special Diploma in Public Health, granted upon examination by one of several recognized schools, in subjects covering the whole field of State medicine. Your committee, therefore, asks you to call the attention of the Regents of the State University to this matter, and to ask them to carefully consider this subject and provide for the examination of all physicians candidates for the position of health officers in the State, and to grant to the successful candidates a special Diploma in Public Health. And to the end that this may operate for the permanent welfare of the whole State, it asks that you request our Committee on Legislation to frame such laws as in their judgment seem necessary to make it imperative upon all communities in the State that have health officers to require the proof of especial fitness for the duties of the office to which they aspire.

Respectfully submitted,

JNO. F. HEFFEN,
GEO. B. FOWLER,
JOSEPH D. CRAIG,
D. V. STILL.

CO-OPERATION ESSENTIAL TO PROGRESS IN VITAL STATISTICS.*

By CRESSY L. WILBUR, M. D., Chief of Division of Vital Statistics, Department of State, Michigan.

This paper is an attempt to show some of the ways in which co-operation betwen the national, State and municipal officers engaged in the collection, tabulation and study of vital statistics may be very useful, or even indispensable, to further progress.

Vital statistics, and especially mortality statistics, are universally acknowledged to be the absolutely necessary foundations of modern public-health work. Notwithstanding this fact, and although scarcely a State or city in the country is without its public health administration, the United States is almost alone among the civilized nations of the world in having no national system of vital statistics.

This condition has arisen from the constitution of our government, whereby the collection of vital statistics has been usually a part of the State administration, although in some cases data have been obtained by city ordinances without correlation with the State administration. The function of the national government has been confined to an effort to obtain vital statistics in connection with the regular decennial censuses, at first by an attempted enumeration of the facts coincident with the enumeration of population, and latterly by an increasing use of the material collected by the States and cities comprising the "registration area."

The statistics collected by the individual States and cities have varied greatly in quality. The most diverse methods of collection and compilation have been employed, and only a small proportion of the States that have attempted to collect such data have made a practical success of it, even on the somewhat low standard of 90 per cent. of accuracy for mortality statistics alone. There has been little co-ordination, and a State undertaking to install a new system of vital statistics has been quite as likely to make all of the blunders that have involved other States in disaster as to follow the methods that have been tested by experience in other States and found essential to satisfactory results.

*Paper read at the Meeting of the American Public Health Association in New Orleans, December 8-12, 1902. Abstract from the Proceedings by permission of the Secretary.

After the statistics have been collected, the same hopeless lack of uniformity and approved system may be found in the registration reports published. Tables regarded as essential in the reports of one State may not be represented at all in those of another, and the details of age periods, etc., vary so greatly that comparisons are frequently difficult or impossible. No uniform methods of computing and stating death rates are in general use, and up to a very few years ago no general agreement existed in even such a vital feature of mortality statistics as the adoption of a uniform classification of causes of death.

The latter difficulty—the adoption of a uniform classification of causes of death—stood at the very threshold of any course of action whereby vital statistics might be made more uniform and comparable than formerly. If registration officials could agree on the use of a uniform and fairly satisfactory classification, it was likely that they would afterward come to a basis of satisfactory union with respect to other statistical features of scarcely less importance. But for over fifty years the lack of a uniform classification of causes of death had stood in the way of progress in vital statistics, and it seemed hopeless to attempt much in this direction until this obstacle could be removed.

As you know, the American Public Health Association was largely instrumental in bringing about this greatly needed reform. At the meeting held at Ottawa, in 1898, the Association urgently recommended the adoption of the International Classification, as it is now known, by all of the registration offices of the three countries, and especially by their census offices. The general plan of a decennial revision proposed by this Association was indorsed by the International Statistical Institute, the revision was held at Paris in 1900, a special invitation being extended by the French Government, through the usual diplomatic channels, to all of the countries participating, and the results were presented for general use beginning with the first year of the present century, 1901.

All of the registration States of the Union have adopted this uniform system, as well as the United States Department of Labor and the United States Census. The Classification is likewise supreme in Canada and Mexico, so that the constituent countries of this Association are a unit in this respect. It is proper to say that the preliminary work of revision was not as completely carried out in this country as it should have been, owing to the fact that the recommendations of your committee on Demography and of your special Commission on the Revision of the Bertillon Classi-

fication, made to you at the meeting at Minneapolis in 1899, were not carried out, owing, perhaps, to the late period of the session at which the report was made. As far as possible, under the circumstances, the United States Commission of Revision performed the necessary work up to that time, and all of the suggestions received from American registrars were given consideration at Paris. No invitation to the International Commission of Revision, however, reached this Association or its special Commission, by whom all of the preliminary work in this country had been done. The United States was represented by the United States Marine Hospital Service, which had not previously been associated in this work, except as represented by delegates to this Association. For this reason the Commission and the Association may disclaim responsibility for the actual results of the revision, although it seems desirable that we now heartily join in the use of the revised version until an opportunity shall come, with the next regular decennial revision, to further perfect the work.

As an indispensable step in this direction, the United States Census Office has recently issued a Manual of the International Classification, which contains not only the assignment of all terms found in the French version, but also many hundreds of terms actually occurring in the practice of American registrars, but for which no provision had been made by the International Commission. Some of the more important of these terms would have been regularly provided for had not this Association failed to authorize the completion of the work undertaken by it, but as the exigencies of the Census compilation would not permit delay or reference to committees, the assignments of all such terms were necessarily made with the hope that they would prove, for the most part, in accordance with the general judgment of American registrars.

Another matter of great practical difficulty in the compilation of mortality statistics is the treatment of returns in which the physicians have assigned two or more causes of death for the same case. The International Commission did not consider this subject in detail, although a method of procedure was prepared by Dr. Bertillon and appended to their report. Many of the decisions, however, would hardly be acceptable to American registrars, and the whole subject demands the most earnest attention in order that some rational, definite and practicable plan of treatment be formulated and generally adopted.

It may be feasible to introduce a system in which certain weights

or "ratings" shall be assigned to each cause of death as reported by physicians. We ordinarily consider two factors in determining the precedence of one cause of death over another, in the absence of any other information as to duration, primary or secondary occurrence, etc. These factors are (1) the *importance* of the title to which the given term would be assigned in the classification, and (2) the degree of certainty that the term really belongs under that particular title. Thus, using a decimal scale, pulmonary tuberculosis is a title of first rank, say 10, as compared with pulmonary congestion, say 2 or 3 on the same scale. If chronic Bright's disease be returned in connection with pulmonary tuberculosis, we can compare the two by assigning the same number to Bright's disease if we consider it of equal statistical importance, or by assigning a lower number on the scale, as 8 or 9, if we consider it less important. Again, whatever rank we give to Bright's disease, it is evident that a death so returned is much more certainly due to the disease in question than if returned from uremia, which is likewise compiled under this title, perhaps improperly. Uremia should be marked, 1, 2 or 3, with respect to its vitality as a synonym of Bright's disease. Now the products of the numbers representing the *importance* of the titles into the numbers representing the *validity* of each term under its title, both taken on the easily denoted decimal scale, will give an index number for each term on a scale of 100, by which the preference of assignment between any two or more independent terms may be decided. The occurrence of diseases as frequent complications or sequelae would be taken into consideration in a general way in rating the relative importance of the titles, besides which complete lists should be prepared showing such relations.

Such a plan as that suggested for the proper disposition of jointly returned causes of death would not only be of service in determining such assignments, but it is evident that a series of rates obtained for this purpose would be directly in the line of a detailed and specific criticism of the classification itself. Should a given title be generally rated as of "0" importance, or a certain term be generally marked as not properly pertaining to the title under which it has been included, then we would have exactly the information that we require for proposing and supporting a change in the International Classification. In other words, we would substitute a definite numerical rating for a more general expression of opinion.

To make the proposed plan a success it is necessary that the

fullest co-operation should obtain between all of the important interests represented. Neither the collectors, compilers nor users of mortality statistics should be neglected, nor, above all, the wishes of the mass of the profession from whose returns of causes of death all our mortality statistics are derived. It is a large undertaking and calls for careful planning and excellent facilities to make it a success. By the use of the Manual of the International Classification as a basis, and with the full co-operation of the Census authorities with committees representing this Association, the Conference of State and Provincial Boards of Health of North America, the Medical Association, and the various special organizations, I am confident that a thoroughly representative body of opinion could be collected in usable form, and I hope that this Association may decide to undertake the work. I regard it as not less important than the resolutions passed by this Association in 1898, which were the first harbingers of international uniformity.

The Conference of State and Provincial Boards of Health has already constituted a Committee, by action taken at its recent meeting, at New Haven, October 28-29, which is fully authorized to act in conjunction with the Committee of this Association for the improvement of methods in vital statistics. The text of the resolution under which the committee of the Conference was appointed, reads as follows:

Resolved, That a committee be appointed by the Conference of State and Provincial Boards of Health of North America to cooperate with the U. S. Census and with similar committees from the American Public Health Association, American Medical Association, and other organizations, in the promotion of the uniformity and comparability of mortality and other vital statistics and their satisfactory presentation in statistical reports and bulletins.

It will be observed, under the foregoing resolution, that the committee of the Conference proposes not only to deal with matters of classification of causes of death, but also with the methods of statistical compilation and presentation of mortality and other vital statistics in the various annual reports and quarterly, monthly or weekly bulletins. It is desirable that important tables be always given in these reports in such forms that comparisons will be readily made, and it is possible that study of the subject will show that certain tables may be presented in better forms and other tables, possibly, be dispensed with in favor of more important data. Rates should be uniformly calculated, and reliable methods should

be employed for estimating populations for intercensal years. The United States Census Office, which is now established upon a permanent basis, has in preparation the tables for the first of the regular annual reports on mortality statistics derived from the registration areas of the United States, and as the material for these annual reports consists of transcripts of the records of the State and municipal registration offices, it may be desirable to avoid unnecessary duplication of work by utilizing certain of the standard tables of the Census reports.

We have now in the Census Office a clearing-house, in which the mortality statistics of all of the registration States and cities will be regularly brought together each year for statistical study and comparison. As far as it goes, and it is altogether dependent upon the extension of reliable methods of registration by States and cities, it constitutes the national system of registration that we have all so long desired for the United States. It has the disadvantage, from a practical point of view, that it cannot deal at first hand with the collection of the data, but must depend upon the efficiency of the various State systems of registration. It is, therefore, to us, the members of this Association concerned with the administration of State registration laws, that the Census must look for the quality of returns, and we owe it to ourselves as constituent parts of the national registration system that the character of these returns be made as excellent as possible for each of our individual offices.

While the Census does not undertake to collect vital statistics directly, nor to enforce any regulations under which such work must be conducted, it is eminently proper that it should assist State officials undertaking such work or desiring to adopt better methods and endeavor to insure that the results obtained shall be sufficiently uniform and accurate to fit them for national use. To this end the special circular on the essential requirements of a registration law was prepared in co-operation with a committee of this Association, one of whose results has been the adoption of a standard form of certificate of death in Colorado, District of Columbia, Illinois, Indiana, Michigan and New York, representing an aggregate population of 17,846,306, or about 70 per cent. of the present possible registration State population. In the preparation of the Manual of the International Classification, as well as the suggested work in regard to uniform methods of presenting mortality statistics, the Census has earnestly endeavored to carry out the expressed wishes of American registrars and sanitarians.

The only direct leverage that the Census at present possesses with reference to the extension of satisfactory methods of registration, is the power that it has to decide whether a State or city shall be included in the registration area or not. Certainly a great State like Ohio, or Pennsylvania, upon whose statute books registration laws have been written for years past, should take shame that such legislation is so inefficient that the State was not admitted as a registration State by the Census. And a State like Delaware, once admitted, but now dropped on account of inaccuracy of the returns, should endeavor to retrieve the lost ground and once more have the privilege and honor of belonging to the registration group. I assure you that we appreciate that privilege in Michigan, and I believe that the whole State takes pride in the fact that it was the first State of the West to be admitted to an equal standing with the progressive registration States of New England, New York and New Jersey.

Besides the advantage of belonging to the registration area—and I hope that members of State and local Boards of Health here present will not desist from active work until proper laws have been enacted and enforced in their States relative to the collection of vital statistics—there is another way in which it might be practicable for the national and State services to co-operate, provided that Congress could be brought to see the desirability of such legislation. As furnishing the primary data upon which the national statistics of the Census Office are based, the several State registration offices are an integral part of the national system. The States pay a considerable sum each year for the collection of deaths, at the rate of twenty-five cents or more apiece for each death registered. The deaths thus returned are freely placed at the disposition of the government without compensation, except a nominal amount for the cost of making transcripts. Without proposing any direct compensation to the States for these returns, except such as at some future time may be necessary in certain localities for the purpose of insuring complete registration, I would suggest that it would be proper and desirable, and would greatly facilitate the collection of vital statistics, to extend the facilities of the United States postal service to the collection of vital statistics by the States. Just as in Canada, all returns of deaths from the local registrars to the central registration offices of the State should be sent post free, as well as the returns from the State offices to the Census Office at Washington as at present. The use of blanks for securing corrections of imperfect returns from local registrars

or from the attending physicians would be greatly extended, and the general supervision and control resulting from the necessary maintenance of a certain standard of efficiency by the State offices in order to enjoy these privileges, would tend to elevate the entire service. In no other way would it seem that Congress could so effectively, and yet unobtrusively, exert an influence for the extension of satisfactory registration methods in this country as by offering the free use of the mails as a direct inducement to attain a certain minimum standard of efficient registration.

Co-operation is the key to success in this work, which is dependent upon the harmonious action of so many disconnected offices and interests. The benefits and obligations should be mutual as between the local and municipal offices and the central registration office of the State, and between the latter and the national registration office. The people should support the registration work, and all registrars, public health workers and members of the medical profession should educate the people as to the necessity for the collection of vital data. Local registrars should endeavor to raise the standard of returns of causes of death, and should depend upon the hearty co-operation of the profession for this end, supported by assistance from the State office. The latter should endeavor to make its returns uniform, prompt and accurate, so that they will be fully available for the use of the annual reports of the Census. In its turn, the Census Office should endeavor to aid in the spread of registration in States that do not possess such laws at present, should furnish all helpful aids in its power to the State and local offices, and by its annual reports, embracing returns from all registration areas, will be enabled to make the mortality statistics received of the greatest practical value to registrars and sanitarians. Finally, the function of such organizations as the American Public Health Association is a very important one, for by their agency the necessary organization and helpful co-operation between all the interests and agencies involved can probably best be effected.

We are at the beginning of a new era, when, for the first time in the history of this country there is an opportunity for continued systematic co-operation beetween a permanently organized department of the national government and the various State and municipal systems of registration to the end that accurate and uniform statistics of mortality may be obtained for the United States and made available for the use of all public health offices. This Association has already taken the initiative in securing a

greater degree of uniformity in the tabulation of mortality statistics than has ever existed in the history of the country or of the world, and has further most efficiently co-operated with the permanent Census Office in efforts for the promotion of the satisfactory registration of deaths. Let the success of our previous efforts stimulate us to increased activity in this direction, and by enlisting the aid of the various national and State associations that may be prepared to co-operate with us and with the Federal Government, let us endeavor to further promote the usefulness of our vital statistics, and enable the United States to take a leading place in this respect among the nations of the world.

THE CURSE OF GROG.

The Way Drink Lets People Alone Who Let It Alone.

From New York "Telegram, Nov. 25.

Charged with felonious assault for the alleged beating of his aged mother with her own crutch when she refused to give him money, John Donaldson, forty-three years old, of No. 778 Henry street, Brooklyn, was arraigned in the Butler Street Police Court to-day. His mother, her skull fractured and badly beaten, lies at the point of death in the Long Island College Hospital.

Donaldson is held to await the result of his mother's injuries.

When he was arraigned before Magistrate Tighe he was very repentant.

"Whisky brought me to this," he said. "It was the 'red devil' which prompted me to do that. I don't remember beating my mother. I must have had the horrors. All my trouble is due to drink.

"Fifteen years ago I was given five years in Sing Sing for shooting a man. That was the result of drink. We met in a barroom, got drunk, had a quarrel, and I drew a pistol and shot him.

"I tell you I'm done with drink forever."—"National Temperance Advocate."

THE INFLUENCE OF THE DISCOVERY OF THE RELATION OF BACTERIA TO DISEASE ON THE PRACTICE OF MEDICINE EXCLUSIVE OF SURGERY.

AWARDED THE SCHUYLER ALUMNI PRIZE FOR 1901.

By H. JUDSON LIPES, M. D., Lecturer on Obstetrics, Albany Medical College; Obstetrician to the Albany Guild for the Care of the Sick Poor.

(*Continued from Page 149—Preceding Number.*)

ETIOLOGY.

Scientists, and every one, in fact, in these days of progress, are not satisfied unless the *causa prima* of all effects is known. It was easy enough to satisfy earlier observers, and in ancient or in mediæval times all unknown causes were ascribed to the gods.

The Greeks before Troy ascribed the presence of the great pestilence, which nearly devastated their armies, to the arrows of the offended god, Apollo. Camp hygiene at that early date was an unheard of subject and presented a problem as great as concerns our armies to-day. Homer, in the Odyssey, makes the father of gods and men say: "Lo, how men blame the gods: From us they say spring troubles. But, through their own perversity and more than is their due, they meet with sorrow." This notion that pestilences are punishments for sins, and that they can be combated by sacrifices, prayer and pilgrimages, survives to-day in the midst of civilized Europe—an example of the deep-rooted proclivity in untrained minds towards a search after the animate.

Through bacteriology we have been enabled to determine, practically with certainty, the causes of numerous diseases, while we are still in doubt as to the specific germs concerned in other conditions. And not only have the causes been ascertained in many diseases, but the modes and portals of infection have been determined, which is of great practical value in the prevention and treatment of diseases. Then, too, as has been pointed out by

various observers, there are certain conditions which may not be constantly associated with any well-defined group of clinical manifestations although caused by bacilli probably pathogenic under certain conditions.

Let us first consider those diseases in which the specific germ has been discovered.

Diphtheria.—Perhaps, of all the specific diseases that have engaged the attention of physicians and bacteriologists, none has been productive of greater results, as we shall see further along in our discussion, than diphtheria. The diphtheria-bacillus was first grown in pure culture by Löffler, in 1884, although, as we have already stated, it was observed by Klebs the year before. The portal of infection for the diphtheria-bacillus may be constituted by any mucous membrane or wound surface, infection commonly taking place in the pharynx.

Influenza.—Among the acute general diseases which have created a havoc the world over during the last ten years influenza is certainly at the head of the list. In 1892, Pfeiffer published a classical work on the cause of influenza wherein he accurately described the causal relationship between the bacillus and the disease, although Kirchner probably first saw the bacillus. This organism was first seen and isolated from the sputum of influenza cases during the great epidemic of 1889-90. Like a number of other infectious diseases, influenza was suspected to be due to some minute parasite long before the true cause was discovered, but failure to find the germ was due to the fact that it stained with difficulty; is an exceedingly small germ, and that it did not grow on our ordinary culture media.

Tuberculosis.—Tuberculosis, the enemy of mankind and the most devastating of all diseases the world over, was commonly believed to be an infectious disease many years ago in some countries, but it is only within comparatively recent times that the infectiousness of the disease has become an established fact in scientific medicine. Villemin gave the first evidence of the infectious nature of tuberculosis by inoculation of tuberculous material. The tubercle-bacillus was discovered by Koch in 1882. What a hope was raised the world over when this discovery was announced. Every tuberculosis patient then anxiously awaited the cure which every newspaper promised. Still, while the results of this discovery were not so prolific as one might wish for, it has led to other investigations which will undoubtedly prove of greater importance.

Asiatic Cholera.—Koch likewise discovered, in 1883, that the exciting agent of Asiatic cholera is the comma-bacillus. These comma-bacilli are found constantly in all cases of Asiatic cholera, and in innumerable amount; in part in pure culture in the liquid intestinal contents; further, in the intestinal walls of patients; and only exceptionally in other organs. The vibrios can be demonstrated in the feces on an average to the tenth day after the inception of the disease and have never been demonstrated in association with other diseases.

Bubonic Plague.—Another disease which has attracted considerable attention during the past two years, in which the cause is positively ascertained, is bubonic plague. The exciting agent of the plague was discovered by Kitasato and Yersin during an epidemic of the plague in China in the year 1894. The plague-bacillus gains entrance into the human organism most frequently by way of slight injuries, scratch-wounds, etc. Infection through the skin may take place simultaneously at several different points of the body in the same case, and in all probability it can occur through the intermediation of insects. Much that we know concerning this disease is due to the work of the German commissioner who went to Bombay in the beginning of the year 1897.

Relapsing Fever.—The cause of relapsing fever was, in 1873, found by Obermeier, a former assistant of Rudolph Virchow, and who died prematurely, to be a special spiral bacterium, which he designated the spirocheta of relapsing fever. Obermeier's discovery was the more far-reaching, because with it an organism of the class of bacteria was for the first time recognized as the cause of a human infectious disease. These spirilla are present, and in varying number, only in the blood of those suffering from relapsing fever, in which they appear a short time before the onset of the fever, multiplying rapidly during the continuance of the fever, to disappear, a short time before the critical defervescence, until the onset of the next febrile paroxysm. These spirilla are not ordinarily found in the secretions and excretions of patients suffering from the fever, and with equal variety outside the human body, they are, therefore, most rigid blood-parasites. Just how this disease is transmitted is yet unknown.

Tetanus.—Nicolaier, of Göttingen, in 1885, recognized the exciting agent of tetanus as a bristle-like rod with a terminal bulbous spore, but it was first isolated by Kitasato, in 1899, from the foreign bacteria always asssociated with it in infectious earth and in pus from a case of tetanus and grown in pure culture. The

portal of entry for tetanus-bacilli in human beings may be constituted by any lesion of the external integument. Before the days of aseptic surgery it was the frequent concomitant of operative procedures. In human beings the bacilli never enter the blood or the viscera, but remain confined to the site of original infection.

Anthrax.—Anthrax, which is a disease of animals, particularly of sheep, is sometimes transferred to human beings through contact with animals suffering from this disease or from the cadavers of those dead of the disease. Tanners are particularly exposed to the danger in manipulating the skins of animals dead of anthrax. As early as 1849 Pollender, in Germany, and Rayer and Davaine, in France, in 1850, were the first, independently of each other, to detect bacilli in the blood of animals suffering from anthrax. The experimental development of the disease by means of the bacillus, however, was first successfully accomplished by Koch in 1876.

Glanders.—Another disease peculiar to animals, but sometimes transferred to man, is glanders. In human beings, who, in the vast majority of cases, are infected by contact with horses suffering from glanders, the skin, without doubt, constitutes the principal portal of infection. From a pathologic-anatomic standpoint, glanders belongs to the group of diseases that, like tuberculosis, give rise to the formation of nodules that exhibit a marked tendency to disintegration and softening. The exciting agent of glanders was discovered in 1882 by Löffler and Schütz.

Gonorrhœa.—Gonorrhœa, a disease which formerly was treated by purely medical means, has now more or less passed into the hands of the surgeon. But the disease is so universal that we may at least call attention to its etiology.

The exciting agents of gonorrhœa, the gonococci, discovered by Neisser, in 1879, are cocci which are separated into two distinct hemispheres by means of a dividing fissure. Gonococci are constantly present in secretion from all gonorrhœal inflammations.

Diseases caused by the Protozoa.—The protozoa, the lowest forms of animal life (consequently not "bacteria"—although as previously stated we believe the class of diseases caused by these parasites come clearly within the limits of our subject), have hitherto taken part in the etiology of but a small number of diseases in human beings. Perhaps the future will show that they occupy a larger field of activity. In a number of infectious diseases whose exciting agents are as yet unknown, animal parasites are believed to have been observed—as, for example, in whooping-

cough, in carcinoma, and they have been apparently found as the cause in smallpox. The connection of disease with the lowest forms of animal life has, however, been established with certainty only for two affections—namely, dysentery and malaria.

Dysentery.—The cause of dysentery (amebic enteritis) was recognized by Losch, in 1871, as peculiar animal parasites belonging to the class of protozoa-amebæ—which were found in dysenteric stools. Many other observers have since studied this organism carefully and confirmed its etiological relation to dysentery.

Abscess of the Liver.—Abscess of the liver, which occurs so frequently in tropical regions, has long been associated clinically with dysentery. It has mostly been considered as a sequel of the latter disease, and although a condition needing surgical interference comes under our category. As a matter of fact, the pus and the abscess-membrane in cases of tropical abscess of the liver almost invariably contain the same amebæ that cause dysentery.

Malaria.—It is due to the elaborate study of malaria by Laveran that we are indebted for the discovery of the cause of that disease in 1880. The parasites of malaria are unicellular forms of life that at an early stage are endowed with ameboid movement. They belong to the class of protozoa, but there is no unanimity of opinion with regard to their position in the zoologic scale. The designation malarial plasmodia, proposed by Marchiafava and Celli, is appropriate. The parasites appear in part free in the blood-plasma, and in part in association with the red blood corpuscles.

Besides the diseases mentioned above due to bacteria or to the protozoa, we have certain classes of diseases which have been designated mycoses, the etiology of which is concerned with the moulds (filamentous fungi and the budding fungi).

Etiology of Mycoses.—The etiology of the diseases in human beings induced by filamentous and budding fungi has been determined by the careful studies of bacteriologists.

Among these diseases we have the dermatomycoses, which include favus, herpes tonsurans, pityriasis versicolor and erythrasma. Psoriasis was once included on the list, but its supposed excitant, the epidermis phyton, has been recognized as a factitious product (Ries).

Favus.—The cause of favus was recognized as early as 1839, by Schönlein, as a filamentous fungus, which, in his honor, has

been named *Achorion schonleinii,* and which was the first of all organized causative agents of diseases discovered.

Gruby and Malmsten discovered the cause of herpes tonsurans, in 1845, to be the *trichophyton tonsurans.* The presence of this fungus may be cited as the cause, also, of other parasitic mycoses, eczema marginatum, onychomycosis, trichophytina, and a number of other affections of the skin.

A year later (1846) Eichstedt first described the cause of pityriasis as the *microsporon furfur.*

Erythrasma, a circumscribed erythema of the skin, is caused by the *microsporon minutissimum.*

Pharyngomycoses.—In the pharynx mycoses are not at all rarely observed in certain situations. The fungous vegetations which do not give rise to any particular disease, although they act as a mechanical irritant giving rise to slight pharyngitis, appear as small, porcelain-white plugs, mostly in the lacunæ of the tonsils. They consist, however, as a rule, not of true molds, but more commonly of filaments of the leptothrix buccalis, whose botanic position has not yet been clearly made out, but which is ordinarily included among pleomorphic bacteria.

The keratomycoses and otomycoses are due to the presence of the *aspergillus fumigatus.*

Pneumonomycoses have been observed repeatedly in human beings, and are found by the bacteriologist to be due to both the *aspergillus* and the *mucor.*

Thrush.—Thrush, a local disease most commonly found in newborn children, results from the lodgment and proliferation of the *thrush fungus.*

Etiology of Inflammatory Diseases.—Through bacteriology we have also been enabled to discover the causation of the various inflammatory diseases and of suppuration. Principal among these conditions stands erysipelas, which is excited by the streptococcus erysipelatis of Fehleisen, which is now considered as identical with the streptococcus pyogenes.

Lymphangitis.—Lymphangitis has been found to be due to pyogenic cocci, and at times to the bacterium coli. Also the infectious form of phlebitis, which occurs as an essential manifestation of numerous infectious diseases, may be caused by the same micro-organisms as give rise to the original disease. Thus, for instance, tubercle-bacilli have been found in the plebitide of tuberculous individuals, and the streptococcus pyogenes in the

phlegmasia alba dolens of puerperal women, or the typhoid bacillus in typhoid fever.

In the inflammatory conditions of the nose and throat, staphylococci and streptococci have been found, and also pneumococci and pneumobacilli, to be the cause of the lesions.

Meningitis.—Inflammation of the cerebral meninges occurs as a primary disorder in the form of epidemic cerebro-spinal meningitis when it is due to a special organism, the *diplococcus intracellularis meningitidis* (Weichselbaum, Jäger). Meningitis occurs as a secondary condition, when, as in pyemia, and numerous infectious diseases, especially in the sequence of otitis media, inflammation of the accessory cavities of the nose, and in croupous pneumonia. From the exudate in cases of secondary meningitis there have been cultivated the diplococcus lanceolatus Fränkel, the streptococcus pyogenes, the staphylococcus pyogenes, the bacterium coli, and the diplobacillus pneumoniæ Friedländer, and in cases of tubercular meningitis, the tubercle-bacilli.

Typhoid Fever.—In view of their constant presence in all cases of typhoid fever, and of their occurrence exclusively in this disease, the Eberth-Gaffky bacilli (first observed by Koch and Eberth and grown in pure culture by Gaffky in 1884) may be considered as the exciting agents of typhoid fever, although experimental development of typhoid fever by means of the bacilli has not been induced.

Pneumonia.—The etiology of croupous pneumonia is more complex. Fränkel's pneumococcus may be looked upon as the causative agent of lobar pneumonia, as this organism is demonstrable in more than three-fourths of all the cases in the pulmonary tissues, which, normally, are entirely free from bacteria. Streptococci alone, or in association with staphylococci, rarely staphylococci alone, may, however, be found in pneumonia foci.

Actinomycosis.—A disease whose exciting agent occupies—to a certain degree—a connecting link between molds and bacteria—is actinomycosis. Kruse includes this organism among the *streptothrices*. Isolated cases of actinomycosis in human beings had already been observed by B. V. Langenbeck (1845), and by Lebert (1857), but the disease was first clearly recognized and accurately described as an independent affection by J. Israel, in 1878. Bollinger, in 1877, recognized its causal agent as the actinomyces or ray-fungus.

Streptothrix Broncho-Pneumonia.—Norris and Larkin recently reported two cases of necrotic broncho-pneumonia where the

streptothrix was found in the exudate, the pleura was covered by a necrotic layer containing clusters of this organism and numerous streptococci, and the bronchi, large and small, had clusters either free or lightly attached.

Meat Poisoning.—Botulism—a disease arising from the ingestion of special kinds of sausage, by decomposed salt fish, smoked meat, ham, etc., has been investigated by bacteriologists with regard to the exciting agent, but the whole question was involved in considerable doubt until recently, when Van Ermengem, in an epidemic at Ellezelles (Belgium), made the discovery of a specific anaerobic microbe, the *bacillus botulinus.*

In the foregoing named diseases the cause has been positively ascertained, and we now come to a class whose bacterial cause is probably identified.

Malta Fever.—In this class we find Mediterranean or Malta fever, which is not of much interest to us, as it is confined to the countries along the Mediterranean coast, and which resembles typhoid fever, except that ulceration of Peyer's patches does not occur. Bruce discovered the organism which probably caused this lesion, and therefore it is called the *micrococcus melitensis* of Bruce.

Leprosy.—Leprosy, while seldom seen in this country, attracts our attention as it is of frequent occurrence in our new possessions. The bacillus of leprosy was discovered by Amner Hansen. It has thus far not been successfully cultivated, and some doubts exist as to Hansen's bacillus being the true cause.

Smallpox.—While no bacteria have been found in smallpox or vaccinia which seem to have any relation to the disease except as secondary infections, L. Pfeiffer and others have constantly found small homogeneous bodies in the epithelial cell substance, which apparently belong to the class of protozoa, and from their constant presence are believed to be the probable specific micro-organisms of both diseases.

Regarding the bacteria believed by some to be casually connected with certain diseases we are still in doubt.

Yellow Fever.—In 1897, Sanarelli announced the discovery of a micro-organism which he claimed to be the specific cause of yellow fever. This he called the "bacillus icteroides." It is found in the circulatory blood and in the tissues of yellow fever patients. It resembles the colon-bacillus. Since Sanarelli's supposed discovery a number of investigations have been made into the causal relation of this organism to the disease, some of which seem to

cast considerable doubt upon its being the specific cause of yellow fever.

Whooping Cough.—From time to time observers have found in the sputum of persons suffering from whooping-cough small bacilli, often in great numbers. They have been lately studied especially by Koplik, Czaplewski and Hensel, who believe that these bacilli are the cause of the disease.

Syphilis.—The exciting agent of syphilis is not yet known. Of the numerous bacteria that have been found and to which etiologic significance has been attached, the bacilli described by Lustgarten seems worthy of mention. Whether bacteria are the cause of spyhilis at all is wholly doubtful, although Lustgarten's bacillus may possibly bear some relation to this disease.

Soft Chancre.—The exciting agent of soft chancre may be Unna's bacillus, but experimentations do not confirm it.

Cystitis.—In cystitis the bacterium coli commune of the bacterium aerogenes may play an important part in its etiology, although in other specific diseases cystitis may be a complicating lesion when it is due, as in gonorrhœa, to the specific organism.

Instead of giving diseases caused by certain germs, we might also make a list of germs which are not always pathogenic and are not constantly associated with any well-defined group of clinical manifestations.

Bacillus Pyocyaneus.—The bacillus pyocyaneus is, in general, quite a harmless bacterium, being present in the pus of wounds, in cases of otitis media, etc., giving rise to greenish or bluish. In children sometimes this organism exhibits pernicious activity, and it may cause, under certain circumstances, a severe general infection.

Weil's Disease.—The proteus-bacteria discovered by Hauser, in 1885, are present in all putrefactive processes, and also in the gastro-intestinal canal. According to H. Jäger, Weil's disease is caused by the proteus. E. Levy found this organism to be the cause of *hemorrhagic gastro-enteritis* after eating spoiled meats.

Bacillus of Malignant Edema.—The bacilli of malignant edema, the vibrio septicus, are widely distributed in nature. They are the attendants of putrefactive processes. Malignant edema occurs at present, but seldom in human pathology, and the rareness of this condition, as well as of the *septicemie gangreneuse* and the *gangrene gazeuse* of the French, is due to the practical results of the researches of bacteriologists.

Bacillus of Friedlander.—Originally it was supposed that the

bacilli found in several different lesions, principally in ozena, rhinoscleroma, otitis media, lobar pneumonia, etc., were one and the same organism—which was termed the bacillus of Friedländer. Bacteriologists have reclassified the bacteria found in these conditions, and have found that the following named bacilli were formerly included under the bacilli of Friedländer: Bacillus nucorus capsulatus Friedländer, bacillus capsulatus Wright, bacillus capsulatus Pfeiffer, bacillus of rhinoscleroma, Howard's bacillus of hemorrhagic septicæmia, and others.

Etiology of the Exanthemata.—Along this line of work there is as yet no proof that micro-parasites occur as the exciting cause of the typical acute exanthemata, like typhus fever, scarlet fever, and measles, unless it be of smallpox. It is certainly striking that the results up to the present time should be negative in just those diseases most markedly contagious, and this is, perhaps, explicable on the supposition that bacteria are not concerned in these affections.

Etiology of Malignant Tumors.—Enlightenment as to the germs causing malignant tumors, especially the epithelial tumors and among them the carcinomas, would be equally desirable. The objects that have, up to the present time, been described as the parasites of carcinoma, will not stand criticism. Important reasons, moveover, are adduced for the view that these tumors are, perhaps, not to be attributed at all to a micro-parasite cause, and hence very stringent proof is necessary to produce conviction on this point.

DIAGNOSIS—BACTERIOLOGICAL LABORATORIES.

Among the most practical results of bacteriological researches is the early diagnosis of certain diseases by methods which serve to demonstrate the presence of the specific infectious agents.

Diagnosis.—The establishment of municipal and private laboratories for bacteriological research was necessitated by the demand for more scientific study of the cause, diagnosis and treatment of disease. Through the establishment of these institutions much help has been given the general practitioner, who desires to avail himself of the opportunity. What satisfaction it is to be able to positively ascertain the presence or absence of the tubercle-bacilli or of the diphtheria-bacilli. It would be impossible for every practitioner to possess the necessary equipment of a bacteriological laboratory even if he possessed the working knowledge, and therefore one cannot overestimate the practical value of these laboratories.

Advantages Offered to Present Graduating Classes.—When the members of the present graduating classes of our medical colleges enter upon active practice there will be open to them many opportunities for making diagnosis which were not afforded to graduates of only a few years ago.

Aid Given by Bacteriology in Diagnosis.—At the present time there are three important ways through which assistance is given us in making a diagnosis.

First, through the demonstration of the bacilli themselves in secretions or in the products of disease; second, through the agglutination-test; third, through the injection of soluble products of the growth of certain bacilli.

So far there are only two or possibly three bacteriological tests which are in general use throughout the country, but when the practitioner becomes more familiar with the technique of bacteriological researches, many new tests and methods will be used by every one interested in the scientific consideration of disease.

Diagnosis of Tuberculosis from Sputum.—Probably the most utilized of all the bacteriological tests is that of the search for the tubercle-bacillus in sputa. The diagnostic demonstration of tubercle-bacilli is of the highest importance for the early recognition of tuberculosis. Owing to the specific behavior of this micro-organism with relation to stains, the demonstration of the tubercle-bacilli can be made with the greatest certainty by means of the microscope, and finding these organisms in the sputum renders unequivocally certain the diagnosis of pulmonary tuberculosis, and often this may be obtained before the disease is revealed by the usual physical examination.

Diagnosis of Diphtheria.—The importance of the early diagnosis of diphtheria cannot be overestimated, and this test is sought after probably more than any other at the present time. Modern treatment of this disease demands, as far as possible, an immediate diagnosis, and through the help of municipal laboratories this is readily obtained. The diphtheria-bacillus may be found in all cases of diphtheria in the diphtheric membrane, and in cases of diphtheria of the tonsils throughout the cavity of the mouth. It lies superficially, usually in large numbers, rarely penetrating deeply, and therefore may be easily obtained for culture and subsequent examination.

Tests for Typhoid Fever.—During the last year the agglutination-test for typhoid has received considerable attention, and is becoming important in the diagnosis of that disease. There are

other diseases, also, which may be differentiated by the so-called serum diagnosis, as we shall see later on, which will in time be commonly used.

Diagnosis of Pneumonia.—Hitherto the bacteriological diagnosis of diseases has been confined largely to those lesions which are practically external or rather those in which the substance for examination is obtained near the surface. But by the aseptic methods known to the surgeon we might obtain the necessary material for examination by carefully introducing aseptic needles into the diseased organ and thus withdrawing the material for study. For example, in pneumonia, we might easily enter the diseased area without any danger of spreading the infection, and from the results obtained might differentiate a lobar pneumonia from an acute tubercular process. There is hardly any structure of the body that could not be entered in this way. The surgeon has already utilized this method and has recognized its great importance.

Under the subject of etiology we have given the agent of infection of the many diseases which have been found up to the present time, and in any of these diseases the discovery of the specific organism is sufficient to form a positive diagnosis.

Let us, in our consideration of the subject of diagnosis, take up the bacteriological examination of the various secretions and excretions of the body rather than consider the diseases individually.

Examinations of Secretions of Naso-Pharynx.—Besides the examination of the throat for the diphtheria-bacilli, we are frequently called upon to differentiate other lesions of the naso-pharynx. In the nasal, pharyngeal and conjunctival secretions we may find, besides many non-pathogenic organisms, the bacillus of influenza, the bacillus of diphtheria, the bacillus pneumoniæ of Friedländer, the bacillus of Weil, the pneumococcus of Fränkel, besides streptococci and staphylococci. All of these bacteria excepting the first named may exist in the upper air passages, but do not occur in the bronchi and in the pulmonary tissues in healthy persons.

The diagnosis of influenza, for example, is thus easily made in the earliest stage of the disease.

If the bacillus of whooping-cough proves to be the true cause of this disease, the examination of the secretions of the naso-pharynx, as well as of the sputum, for this germ will prove of great diagnostic importance.

In specific inflammatory conditions of the conjunctiva, the importance of differentiating diphtheritic from a gonorrhœal or a tuberculous conjunctivitis is very important and may be easily done by the methods of modern bacteriology.

Examination of the Sputum.—The various diseases of the lungs have a deeper significance to us since the causative agents have been ascertained, and methods for finding them have been given us by the bacteriologist. We have two methods of studying this class of diseases: First, by examination of the sputum; second, by direct puncture of the diseased lung with a thoroughly sterilized hypodermic syringe and thus obtaining a few drops of the exudate.

Bronchitis.—Bronchitis, whatever its nature may be, is dependent upon the activity of the common exciting agents of inflammation: pneumococci, streptococci, staphylococci, pneumobacilli, bacterium coli. As has been stated, these germs are often present in the upper portion of the respiratory tract in the healthy individual, but when they become lodged in the bronchi a bronchitis follows through the action of cold or of some other injurious agency. The same cause renders it possible for the bacterium to penetrate more deeply into the air passages, and there to give rise to pneumonic processes. The examination of the sputum, uncontaminated with the secretions of the mouth (which may be obtained by the patient cleansing his mouth thoroughly with a solution of boric acid), is not difficult. The beneficial results of such an examination are most marked. We may thus differentiate a simple bronchitis from a tubercular process.

Differential Diagnosis of Pulmonary Lesions.—We may be able to designate a pneumonia as a pneumococcus, an influenza or a tubercular pneumonia. In other infectious diseases, the diagnosis of which is uncertain, we might have a complicating pneumonia (and complications might occur in other organs), and by finding the germ causing the lesion we would then be able to diagnose the general condition. For example, we would find the typhoid bacillus in the sputum of a case of typhoid pneumonia.

In bubonic plague, bronchopneumonic foci sometimes occur, and the sputum of such patients contains the plague-bacillus often in pure culture, sometimes in association with diplococci and streptococci.

Examination of the Urine.—While the urine is examined more than any other excretion of the body, it is not so important bacteriologically. The findings become of value, however, especially

in certain cases of typhoid fever, when the urine frequently contains the characteristic bacteria, especially in cases complicated by albuminuria. Tubercular bacilli are also found in the pus of urine in lesions of the urinary tract, as well as the gonorrhæal organisms in gonorrhæal cystitis.

Examination of Feces.—The feces examined with care often reveal the causative agents of general or local diseases.

The typhoid bacilli are usually found by the second week of that disease in the feces, but, as a rule, not in large number, and they are isolable only with great difficulty on account of their close resemblance to the bacterium coli commune.

The tubercle bacilli when found in the feces show that somewhere in the intestinal tract there is a tubercular process going on.

In cholera, the vibros can be demonstrated in the feces on an average to the tenth day after the inception of the disease, and as the comma-bacilli have never been demonstrated in association with other diseases the diagnosis is positive when this organism is found.

In tropical dysentery the amebæ can be demonstrated where the fresh stool is examined, as they are regularly present, especially in the mucous elements thereof.

The diagnosis of the two last named diseases is of great importance, especially in the emigrant ports and in our new possessions.

Examination of Urethral and Vaginal Secretions.—The bacteriological examination of the urethral, vaginal and uterine secretions belongs rather to the realm of surgery. The gonococci and the tubercular bacilli are most frequently found together with the micro-organisms of inflammation.

Cerebro-Spinal Fluid.—A direct bacteriologic diagnosis of the meninges is possible during life by means of puncture of the spinal canal, and this method has now been quite extensively practiced. In cases of tuberculous meningitis the pus contains tubercle-bacilli, partly alone and partly associated with phlogogenic cocci. From the exudate in cases of secondary meningitis there has been cultivated the diplococcus lanceolatus Fränkel, the streptococcus and staphylococcus pyogenes, and the bacterium coli. When we find the diplococcus intracellularis meningitidis of Weichselbaum or Jäger, we may be sure that a diagnosis of epidemic cerebro-spinal meningitis would be correct.

Examination of the Blood.—In the examination of the blood much is revealed to us both in a pathological and bacteriological way.

Of all diseases which we now know to have a specific cause, malaria is, perhaps, the most interesting. The clinical picture has been well known for some time, but the diagnosis has often, especially in apparently non-malarious districts, been quite difficult. This no longer obtains, as when an examination is made of the blood, preferably from three to ten hours in advance of the peculiar paroxysm of that disease, when the parasites have reached the height of their development, and a single undoubted malarial parasite is found, the diagnosis is established with certainty. The bacteriologist has also cleared up for us the cause of the several types of malaria—the quotidian, tertian and the quartan—for they have found that the exciting agents of the various types of fever belong to different species. There are other specific lesions which we are now able to diagnose by a study of the blood, and in the list we find malignant endocarditis, pyemia, bubonic plague, pneumonia and gonorrhœal septicæmia.

In relapsing fever the spirilla of Obermeier are present, in varying number, only in the blood of those suffering from this disease, and are not ordinarily found in the secretions and excretions.

A peculiarity of the anthrax bacilli is that while found in the blood they are but seldom found in the larger vessels, but are abundantly present in the capillary area, particularly in the spleen and liver.

In considering the diagnosis of the different diseases we must not forget that if we are not able to isolate the individual germ by pure culture or otherwise for microscopical examination, we may infect some of the lower animals, *e. g.*, the rabbit or guinea pig, with the suspected media, and in this way be able to diagnose the disease from the manifestations of the disease in the animal inoculated, as well as by post-mortem examination of the animal itself. And, too, it is some satisfaction, at least to the clinician, to be able to positively diagnose a condition post-mortem which had been impossible during the life of the patient.

Diagnosis by Means of Agglutination-Tests.—The second very important method by which the early diagnosis of certain diseases may be obtained is the agglutination-test. Through the labors of Gruber and Durham, and somewhat later of Pfeiffer and his pupils, general attention was directed to the behavior of immune serum when added in small amounts to typhoid-bouillon, cholera-bouillon, coli-bouillon, etc. The reaction may be obtained either macroscopically or microscopically.

With an observance of certain precautionary measures the reac-

tion of Gruber is of great service in the differential diagnosis of bacteria that resemble one another morphologically. The diagnostic assistance of this agglutination-test is now being extended to a considerable list of diseases, but it is best known by its use in the diagnosis of typhoid fever where it has proven of inestimable value.

Widal's Reaction in Typhoid Fever.—Widal demonstrated that the serum of typhoid fever patients at the end of the first or at the beginning of the second week of the disease most distinctly yields the agglutination-phenomenon with typhoid-bacilli. This fact is of the greatest importance from a practical point of view, as it renders possible the diagnosis of typhoid fever with the aid of the serum of suspected patient. Blood-serum from the patient suspected to be suffering from typhoid fever is obtained by aseptic puncture of the tip of the finger or of the lobe of the ear. Inasmuch as the serum of typhoid patients, even when not sterile, retains its agglutinating power unchanged for several months, it may be preserved and sent to distant laboratories for examination. As a rule, the agglutinating property appears in the serum after the seventh day of the disease, although it may appear later or earlier. This fact is of importance in diagnosis.

Just what the nature of the agglutinating substance is has not yet been determined.

Malta Fever.—Next to typhoid fever, Mediterranean or Malta fever seems at present the disease in the diagnosis of which we are most helped in the agglutination-test. This condition is not, however, of so much importance to American physicians, except to a few at the several ports where the disease is now frequently seen. But to the physician of Southern Europe it is of great utility.

Relapsing Fever.—At one time it was difficult or quite impossible to diagnose relapsing fever, particularly between the paroxysms, but it is now possible by the use of a reaction akin to the agglutination-test. Löventhal shows that a diagnosis can be made without waiting for a relapse, and that the recognition of the first apyretic stage may be made so that antispirillum serum may be used to ward off further attacks. In doubtful abortive attacks the serum-test may be very useful, and if the result of the test is negative, and other conditions allow it, the patient can be sent home before the end of the fortnight—the usual observation period.

Durham believes that the serum-test with the bacilli most frequently concerned in meat-poisoning (Gartner's bacillus enteriti-

dis) is destined to play an important part in the recognition of the true nature of certain obscure fevers. While practical use is not as yet made of the agglutination-tests in other diseases, well-marked agglutination-reactions have been constantly observed in leprosy, bubonic plague, Asiatic cholera and tropical dysentery. None of these diseases is of great interest to the practitioner in this climate, but they are of considerable interest to the medical department of our present army and navy.

Agglutination-Test for Tuberculosis.—It will be a great benefit to mankind if such a method of diagnosis could be obtained in relation to tuberculosis, but, although individual observers have reported success in the attempt to apply the serum-test to the diagnosis of this dreadful disease, confirmation has been generally lacking. The successful application of this test would be of inestimable benefit since the early positive diagnosis of this condition would result with our present methods of treatment in the cure of such patients. Arloing, in 1898, investigated this method of diagnosing tuberculosis and was the first to apply this method, and in a recent journal Arloing and Courmont have published the result of their investigations to date.

Its Successful Application.—They have formed from the examination of four hundred cases, and from the reports of other authors, the following conclusions: The employment of homogeneous cultures in glycerin-bouillon of the bacilli of human tuberculosis has permitted them to investigate the agglutination-power of the blood, and principally of the serum of tubercular patients, and thus of accomplishing the serum diagnosis of tuberculosis.

Advantages of Sero-Diagnosis.—The advantages of this method are those of sero-diagnosis in general: 1. *Absolute innocuousness,* since the withdrawal of only a few drops of blood or serum is all that is necessary, and since this method is applicable to all patients whether in incipient or advanced stages; 2. *Facility and rapidity,* since it is not necessary to have the patient at hand, and the test lasts only a few hours; 3. *Sensibility* of the reaction in the discrete or latent lesions and difficulty of diagnosis by habitual procedures. In slightly advanced pulmonary tuberculosis the power of agglutination of serum is almost constant. In grave or very virulent cases the sero-reaction is often lacking or very feeble. What we want, however, is the early diagnosis of this disease. Experimental facts confirm those of the clinic. The power of agglutination appears then more often, within certain limits, in

inverse ratio to the gravity of the infection or the extent of the lesion.

Since the serum tests in other diseases have become of great value, and since the early diagnosis of tuberculosis is of so much importance, and, too, since the agglutination-test is almost constant and more marked in the early stages of tuberculosis, the value and future general use of this test will undoubtedly be unlimited.

Injection of Toxins for Diagnostic Purposes.—Another method of diagnosis which has proved of practical utility in but two diseases, is the use of the injection of toxins produced by the growth of the bacteria, as well as of substances extracted from the bacteria themselves, into the body of the suspected individual.

Tuberculin.—The discovery by Koch of toxins in cultures of the tubercle bacillus which possess properties, which explain its pathogenic power, must rank as one of the first importance in scientific medicine, on account of what it has led up to, even if—as appears probable—the final verdict may be that its therapeutic value in the treatment of tubercular diseases in man is very slight.

The chief use to which tuberculin has been put is as an aid to the diagnosis of tuberculosis in cattle and human beings, and for this purpose has proved to be of inestimable value, and has passed into quite general use despite the warnings of Virchow.

Action of Tuberculin.—At first some believed that the irritation aroused in the tuberculous foci by the tuberculin sometimes causes a dissemination of the bacilli and an increase of the disease. Dr. Trudeau says: "No evidence in connection with the tuberculin test as applied to man and animals has been forthcoming thus far from those who have made use of it, which would tend to sustain the general impression that this method is necessarily dangerous and tends invariably to aggravate the disease, and my own experience has developed nothing which would seem to confirm this impression. It is evident that the size of the doses given has much to do with the limitations of this method for usefulness and the correction of the conclusions reached by its application."

A drawback to its usefulness is that it does not reveal at all the extent of the disease, nor whether the tuberculosis is active or dormant. It is, however, of great value in selected cases, both surgical and medical, where slight tuberculosis is suspected, and yet where no decision can be reached. This test will soon be superseded, however, by the serum-test already described.

Mallein.—Mallein, likewise, is frequently used with success to obtain an early diagnosis of glanders. Sometimes the reaction is not forthcoming, as in the application of the test in tuberculosis, since other processes often intervene for the simple reason that the proteids are not *specific* in the ordinary sense of the word.

We have thus seen the great opportunities opened to us by the help obtained through bacteriological researches in diagnosing disease.—From "Albany Annals," July and August, 1902.

(*To be continued.*)

MEDICAL EXCERPT.

By T. P. CORBALLY, A. M., M. D.

ATROPHIC CONGESTION OF LIVER.—MM. Gilbert and Castaigne have presented to the Société de Biologie ("Gazette Hebdomadaire," January 11, 1903) an important communication on trophic congestion of the liver. The possibility of determining the existence of a liver attacked with purely passive congestion and which is really atrophied seems *a priori* impossible and even contradictory.

MM. Gilbert and Castaigne have, however, determined the existence of cases of this nature. They restrict the statement to three indisputable cases, because their existence was proved by an autopsy. The first was a case of mitral contraction congenital in a woman. The second a patient who entered the hospital suffering with an intense asystolic condition. The third a case of emphysema, treated for a dilatation of the right side of the heart with asystolic conditions.

"Well, of these three cases," say the authors, "it is *a priori* improbable that a congested liver can have a volume and weight less than normal. We know that this is not a mere pathological curiosity; it is sufficient to direct attention to the facts to enable one to determine readily conditions of the same kind. The association of the syndrome of severe secondary jaundice with atrophic congestion of the liver is a fact the existence of which must also be clinically recognized. Finally the interesting researches of M. Brault on sclerosis have shown that sclerotic tissue is incapable

of itself of causing the atrophy of an organ; if certain cases of cardiac cirrhosis are atrophic it is not because the fibrous tissue has smothered the glandular tissue, we must find for this anatomical condition another explanation; it seems to us that the possibility of an atrophic congestion of the liver would furnish the explanation, the cardiac cirrhosis, like the congestion, being atrophic, if the hepatic cells are previously reduced to their minimum volume."

IMPERMEABILITY OF MENINGES TO IODURE AND TO MERCURY.—MM. Lannoy and Leroux have studied the liquor-cephalo-rachidian of tabetic patients who have received an injection of 5 cent. of calomel in the muscular tissue every week for a length of time ("Le Progrès Médical," January 11, 1903); the mercury had not been found even once by the electrolysis method even when the presence of lymphocytes indicated a meningeal irritation. The authors conclude that the meninges are impermeable to mercury. The same result was obtained with the use of iodure of potassium in patients having tabes and general paralysis.

M. Sicard, who has made the same experiments with iodure of potassium, has also noted the impermeability of the tissue to mercury. In one case of chronic mercurialization observed by M. Raymond traces of mercury seemed to be discovered; in two other cases in which mercurialization was less pronounced there were no appreciable traces found. The same condition was found in a tabetic patient treated with large doses *d'huile grise*. These facts indicate the absence of favorable results from mercurial treatment for the arrest of certain syphilitic affections of the nervous system and seem to justify the employment of sub-arachnoidal injections, if used very prudently, as more likely to give satisfactory results.

TABES DORSALIS AND CHRONIC AORTITIS.—Under the head "Faits Nouveaux," the "Gazette Hebdomadaire" of January 11, 1903, gives the following:

It has been known for a long time that cases of aortitis in tabes are relatively frequent. P. Fr. Arullani has studied 68 cases of tabes from this standpoint: In 40 cases the existence of aortic lesions was most plainly to be observed; in 11 cases there was aortic insufficiency; in 2 cases aneurysm was found to exist. Syphilis was found to be present in 77 per cent. of the cases of aortitis in tabes.—(Dr. J. Sabrazès, "Revue Neurologique," 1902, p. 971).

TREATMENT OF APPENDICITIS.—M. Lucas-Championnière is in favor of surgical intervention in every case except when the diagnosis is not certain. His record of cases embraces, 1st, 44 cases of appendicitis with profuse suppuration, with 12 deaths and 32 cures, many of these had been considered as desperate; 2d, 85 cases operated on with 85 cures.

According to M. Lucas-Championnière, appendicitis does not recover spontaneously and still less commonly by the usual treatment (ice and opium).

Opium masks or dulls the pain, which is a valuable diagnostic symptom of the disease; it favors the tendency to intestinal poisoning by causing constipation of the bowels. According to M. Championnière cases of appendicitis that would have been cured by medical treatment would not be cases of true appendicitis. On the contrary. And again he is persuaded that purgatives are not so injurious as many are inclined to represent them; they remove the usual incumbrance from the bowels; they in some degree disinfect the intestines and do not in any way cause an extension of the lesion involved in peritonitis. As to the technical operation M. Championnière is of opinion that the safest course is to remove the appendix in every case in which it is possible.

He favors the incision of Jalaguier which causes less exposure of the intestines.

STRABISMUS.—M. Ginestous, a former interne of the hospitals of Bordeaux, has published, in the "Bulletin Médical," a very remarkable article on the forms of strabismus, of which the following are the conclusions, taken from the "Gazette Hebdomadaire," January 11, 1903:

First—Strabismus ought to be generally considered a defect of development of the double organ of vision, due to congenital malformation.

Second—Alcoholism is most frequently found (37 per cent.) in the paternal relations.

Third—Hysteria and the neuroses are most frequently met with (70 per cent.) in maternal ancestors.

Fourth—Syphilis is rare in the ancestors of strabismus. According to Fournier and Antonelli strabismus ought not to be considered a stigma of hereditary syphilis.

Fifth—According to the characteristics of the disease it is the families of alcoholic and hysterical ancestors that are responsible for strabismus in their descendants.

Sixth—The systematic investigation of the physical and psychic conditions permits the consideration of strabismus as a degeneration.

Seventh—The hereditary antecedents of such patients should be considered in the post-operative treatment for re-establishing binocular vision.

INFLUENCE OF ELECTRICITY ON MAN.—MM. Leduc, Malherbe and Rousseau have studied the effect of an electric current of 5 milliamperes with 100 to 200 interruptions, passing from the head to the coccyx in man ("Progrès Médical," December 6, 1902). This process which anesthetizes the dog very rapidly with a current of 2 milliamperes, has produced in man suppression of the cerebral functions, speech is quickly suppressed; a diminution of sensibility and of pain is effected while tactile sensation remains; respiration and the action of the heart are but little modified.

DIAGNOSIS OF LEPROSY.—MM. Leredde and Pautrier.—The presence of bacilli in the nasal mucus of lepers is well known ("Progrès Médical," December 6, 1902). In giving to lepers an abundant nasal douche with iodide of potassium the authors were able to find the bacilli in two patients with leprosy in whom previous careful examinations gave only negative results.

MERCURY IN SYPHILIS.—Justus has already given the results of his investigations on the use of mercury in syphilitic patients. In "Faits Nouveaux" ("Gazette Hebdomadaire," January 4, 1903) he says a large dose of mercury, in injection or in friction, causes after a few hours in the blood of syphilitic patients who have not had any previous treatment characteristic eruptions of the blood as in hemoglobinuria.

Karl Herxheimer and Krause, of Frankfort-sur-Mein, have observed a new reaction of the mercurial salt, which is special in syphilitic cases that have not previously received treatment; in friction or inunction 4 grams of Gray ointment or an injection of 0.1 gr. of salicylate d'Hg. or of calomel will produce in 15 to 24 hours a great modification of the secondary eruption consisting in an increase in the number and the volume of the eruptive elements and possibly of febrile symptoms. The exanthema loses its characteristic qualities, assumes a more florid appearance and even resembles in appearance an eruption of urticaria. The micro-

scopical examination accounts for these changes. The more highly colored the reaction the more rapid will be the cure of eruption.

The mercury, however, can serve but once for this test; the reaction will not be reproduced.

Authors have found that this reaction enables the differentiation of eruptions generally from those that are specific and secondary. These facts merit special attention.—Karl Herxheimer und Krause, Frankfurt A/M; Ueber eine bei Syph vorkommende Quicksilberreaktion. ("Deutsche Med. Woch.," No. 50, 1902.)

CONTRIBUTION TO THE PSYCHOLOGY OF THE EYE.—MM. Vaschide and Vurpas have studied the relation that exists between the action of the eyes and mental conditions (See "Progrès Médical," December 6, 1902).

First—In persons whose eyes are restless and unsteady the indications are of mania or of psychical excitement of a very gay character.

Second—In cases of hypnotism or in the normal condition, disturbance of binocular vision alterations due to change of associated movements or not may be observed.

Third—Strabismus caused by the binocular vision in the agony of death, in certain cases mental intoxication from narcotics or in profound psychological trouble.

Fourth—These conditions seem to indicate that there is a real psychological sympathy in the eye.

REGULATING THE SALE OF POISONS IN BELGIUM.

Geo. W. Roosevelt, Consul at Brussels, reports, August 12, 1902: In default of a special law, a royal decree has just been issued regulating the sale and safe-keeping of poisonous substances in Belgium. One of the first regulations of the decree compels dealers of poisonous drugs and substances to store such articles apart and keep them separated from other supplies, especially those used for food.

Arsenic and its components—arsenical colors, oxalic acid, and oxide of potassium, hydrofluoric acid, bromide, cantharides, cyanide of potassium, calabar, and St. Ignatius beans—excepting cinnabar, must be kept locked in a special closet, upon the door of which the word "poison," in French, shall appear—and in the Flemish section of the country in both French and Flemish—in large, easily deciphered characters. Noxious substances shall be

delivered only upon written request, dated and signed by a well-known person, who shall at the same time explain the intended use of same.

All sales of or orders for poisonous substances must be recorded in a register kept expressly for that purpose, the pages of which must be numbered. Full entry without any omission or blank space must be made in the register immediately after sale or order. The date of sale, kind and quantity of article sold, as well as name, profession, and domicile of purchaser, must be indicated.

Venders must preserve the register for a period of ten years, and carefully file requests written upon unstamped paper.

Poisonous substances must be delivered in receptacles or wrappers of such nature that contents cannot escape.

The observance of these regulations, as concerns venders of drugs and chemicals, will be under the supervision of inspectors of pharmacies, and, as concerns other dealers, under the supervision of the provincial medical commission. The decree will go into effect in three months.

THE CARE OF THE MOUTH IN ITS RELATION TO DISEASE.

The "Therapeutic Gazette," of January 15th, recalls attention to a monograph on this subject, by Dr. Hunter, of London, which it had before noticed, in which he detailed observations which led him to believe that pernicious anemia was often produced by infection of the stomach by an unclean mouth. While these somewhat radical views have not attained universal acceptance, at the same time they possess a sufficient amount of truth to make us regard cleanliness of the mouth as an important factor in the treatment of various diseases, and we all know how greatly the comfort, and, indeed, the health of patients suffering from acute infectious diseases is increased if the buccal mucous membrane is kept clean and moist. Years ago, before the importance of this was recognized, it was not a very uncommon thing for secondary infections from the buccal mucous membrane to occur, but at the present time, in typhoid fever in particular, such complications and sequelæ rarely occur.

Our attention is once more called to this important matter by an

article contributed by Mr. E. W. Roughton to the "Lancet" of October 25, 1902, in which he calls attention to the antiseptic treatment of the mouth, not only because by this means dental caries, and so directly indigestion, is put aside, but also because in this way true secondary infections are avoided. Probably no one has made such exhaustive and complete studies of the micro-organisms of the human mouth as has Dr. Miller, an American, who after studying dentistry in Philadelphia has since obtained for himself an enviable position in Europe. Dr. Miller found in his studies that while bichloride of mercury took the highest place as a disinfectant in the mouth, unfortunately it could not be used habitually because of its unpleasant taste and poisonous properties. So, too, salicylic acid, while capable of destroying mouth bacteria, is contraindicated because of its harmful influence upon the teeth, while the other substances possessing less power fail as oral antiseptics because of their weakness and also because they do not penetrate between the teeth and so seek out the spots from which the bacteria emerge. The most that we can do prior to operations on the mouth in many cases is to use alkaline washes and mildly antiseptic gargles, which, while they do not destroy micro-organisms, will at least render the mucous membrane an unfavorable site for their multiplication.

Toward the end of Mr. Roughton's article he emphasizes a fact which we think is too frequently overlooked, namely, that only too often a mother thinks that milk teeth are not worth looking after as they are only meant to last a short time, whereas the preservation of temporary teeth until such time as they are naturally shed is most important, since their early decay leads to digestive disturbances and to infection of the cervical glands. Further than this, the extraction of milk teeth is apt to result in overcrowding and other irregularities in the permanent teeth when they are cut. Where it is absolutely essential that the mouth should be rendered as sterile as possible prior to operation Roughton advises that all decayed stumps shall be removed, that the teeth shall be cleansed carefully by a dentist, who will remove all tartar, fill all cavities, and that a mouth-wash composed of a grain of bichoride of mercury in an ounce of cologne water be given the patient with instructions to add a teaspoonful of this to a wineglassful of water, and to use it as a mouth-wash thoroughly several times a day, care being taken, of course, that none of it is swallowed.

IS DARWINISM ON ITS DEATH-BED?

The persistent opposition of the late Professor Virchow to the teachings of Darwinism has usually been of late years the most important feature of the international conventions of European scientists, of which he was the leading spirit. His recent death has again brought into public prominence the attitude of German and other continental scholars toward this school of philosophy, with the result that the opponents of Darwinism claim that it is practically on its death-bed. One of the prominent advocates of this view is the well-known Christian representative of the natural sciences, Dr. E. Dennert, perhaps the most pronounced representative of that class who maintain that perfect harmony exists between the teachings of the Scriptures and those of nature correctly interpreted. His latest work on this subject is entitled "Vom Sterbelager des Darwinismus" (At the Death-bed of Darwinism), a pamphlet of eighty-three pages, which contains the views of dozens of naturalists, zoologists, biologists, etc., who are opposed to the Darwinian philosophy. Of the actual status of the present controversy on the Continent, Dennert has this to say:

"Some twenty years ago it was perfectly justifiable to identify the ideas of Darwinism and the doctrine of the descent of man, for at that time Darwinism was the only theory of descent extant. The few who would not accept this could easily be numbered. Only occasionally a scholar, such as Wigand, Kölliker, Nägeli, and a few others dared to raise their voices in protest. Now all this has been changed. Practically all naturalists now make a sharp distinction between Darwinism and the doctrine of descent. A survey of the field shows that Darwinism in its old form is becoming a matter of history, and that we are actually witnessing its death-struggle.

"A fair examination of the leading naturalists of the Continent justifies the claim that the doctrine of descent or evolution is now generally accepted as a demonstrated theory by nearly all scientists. But, on the other hand, it cannot be denied that Darwinism, in the sense of natural selection by means of the struggle for existence, is being crowded to the wall all along the line. The bulk of modern scientists no longer recognize it, and those who have not yet discarded it, at any rate regard it as of subordinate importance. In place of this, older views have again come into

acceptance, which do not deny development, but maintain that this was not a purely mechanical process."

The comments made on the position of Virchow by many periodicals are of the same character, so the "Germania" says. The same journal adds:

"The great bacteriologist, Pasteur, was an outspoken opponent of the materialistic explanation of the origin of things known as the *generatio æquivoca*, or the development of organic beings out of inorganic, in the Darwinian philosophy. He stated his opposition in these words: 'Posterity will one day laugh at the foolishness of the modern materialistic philosophers. The more I study nature, the more I stand amazed at the works of the Creator. I pray while I am engaged in my work in the laboratory."

Virchow was not a professed Christian, but he was as much opposed as was Pasteur to the theory of Darwinism. At the last convention of anthropologists, held in Vienna, Virchow said: "The attempt to find the transition from animal to man has ended in a total failure. The middle link has not been found and will not be found. Man is not descended from the ape. It has been proved beyond a doubt that during the past five thousand years there has been no noticeable change in mankind."

Other naturalists have also raised their voices against the Darwinian views. Notably the zoologist, Professor Rütemeyer, who has written a special work directed against Haeckel, the *alter ego* of Darwin in Germany. In this book, he charges Haeckel with "playing with the public and with natural sciences."

The Strassburg professor of zoology, Dr. Goette, has published in the "Unschau" a natural history of Darwinism, which he depicts as having passed through four stages of development, namely; (1) the beginnings, when it was received with great enthusiasm; (2) the period, in which it flourished and found general acceptance; (3) the period of transition and sober second thought, when its principles and teachings were called into question; (4) the final period, upon which the scientific world has just entered, and when its days will evidently soon be numbered, while the germ of truth it contained will become a permanent possession of modern science.—*The Literary Digest*, Oct. 18, 1902.

"You never kin tell which way any pleasure is a-comin'. Who ever would 'a' thought, when we aimed at the cemetery, that we'd land up at a first-class fire?"—From "Lovey Mary," "The Century," February, 1903.

EDITOR'S TABLE.

SANITARIAN, MARCH, 1903.

Embarrassment incidental to the death of the intended manager, under the new business arrangements, announced in October number, delays the completion of the organization. Meanwhile:

All Communications, business and otherwise, all exchanges and all publications for review, should be addressed to the Editor, as heretofore: Dr. A. N. Bell, 337 Clinton Street, Brooklyn, N. Y.

CORRIGENDA.—In our January issue, in the report of the proceedings of the American Public Health Association, page 27, the statement attributed to Dr. Wilbur, "that in many cities fictitious results were adduced by eliminating deaths occurring in hospitals and other institutions, and yet comprehending in the population all the itinerancy for the time being, insomuch that, notwithstanding the showing, he doubted whether any city in the United States reached an annual death rate of less than 17 per 1,000 of population," is erroneous.

It affords us pleasure to present Dr. Wilbur's excellent paper in full, elsewhere in this number.

THE SUBSTITUTORS.

Apropos the common practice of substitution and the recent phenacetin frauds, the "New York Times" remarks:

"Now that the Board of Health has found forty New York druggists who use wood alcohol, a deadly poison, instead of that made of grain, in the preparation of such common household remedies as camphor and ginger, perhaps 'The Druggists' Circular' will pull in its horns a little and no longer charge that in selecting phenacetin for their tests the Board's chemists took the one substance out of which they could create a sensation. Those chemists have shown that common and inexpensive drugs, as well as uncommon and expensive ones, are fraudulently sophisticated in order to increase profits, and the indignant question propounded by 'The Druggists' Circular,' whether it was reasonable to suppose that men as virtuous as the pharmacists of this city would be guilty of substitution and adulteration, has received an answer different from the one it hoped to receive. Of course there are honest pharmacists, but—there are others, and a lot of them, who can base a claim to honesty only on a confession of criminal ignorance. Are these murderous fellows trying to con-

vince the public that the only way to get pure medicines is to establish municipal drug stores, conducted by salaried officials? It really looks so."

And in verification of the practice of the "others" an ex-druggist verifies the evidence, in an effort to contradict it. He says: "I know this whole matter is greatly exaggerated. The American druggist is a careful and conscientious business man, and not the criminal that he has been made out to be by the Health Department. It is true that of late some foreigners have been landing here in great numbers and gone into the drug business, some of whom, it is safe to say, are not overscrupulous; and no one would find any fault if the dishonest ones were ferreted out and punished. They can be found right among these importations; but to hold up the whole drug trade to view, like a gang of criminals out of jail, is the worst kind of injustice.

"If our reform Board of Health really wants to do some good work, let it set about examining our food nutrients in general. About six years ago, when I was still in the drug business, I remember selling a great deal of chrome yellow to a certain baker; I could never find out just what he did with it, but I am more than satisfied that he used it for coloring cake instead of putting in eggs. Here is a crime far beyond any possibilities in the drug line. Instead of getting nourishment you were slowly getting poisoned by chromate of lead. There is no doubt that the practice is carried on to-day. The baker has a substitute for butter and eggs, and all his flavors are artificial compounds, more or less poisonous. The yellow color, supposed to be due to eggs, contained in cake is always some kind of "paint," mineral in some instances, vegetable in others; but whatever it is, it should not be there, for it is harmful, in a greater or less degree.

"Let our reform Board get to work and make it possible for us to get pure food; then it will be rendering the public a really useful service."

FOR THE INSPECTION OF OYSTER BEDS—A BILL THAT OUGHT TO PASS.

Senate Bill, Int. No. 82.

"An act providing for the inspection of oysters and other shell fish and regulating the sale thereof. Introduced by Mr. Russell," January 22.

It is made the duty of the Commissioner of Health, within thirty days after the passage of this act and at regular intervals

thereafter, to inspect or cause to be inspected oyster beds and other places in this State from which oysters and other shell fish are taken, in order to ascertain their sanitary condition and the fitness of the oysters and other shell fish for use as articles of food. After such inspection is made a record thereof shall be kept and the Commissioner shall issue certificates setting forth the result of the inspection, to the owners or lessees of such oyster beds and places as shall be found in good sanitary condition, and the product of which shall be fit to use for food.

The bill also forbids any person, after June 1, 1903, to sell or expose for sale within this State any oysters or shell fish taken from oyster beds and other places within this State which have not been duly certified by the Commissioner as above provided to be in good sanitary condition, and the product of which to be fit to be used as food.

Persons violating any of the provisions of the act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of $500 or by imprisonment for the term of six months, or by both fine and imprisonment.

NEW VOTE FOR SHORT SKIRTS.

Health Commissioner HENRY MEIGS, of Bayonne, N. J., is encouraged. For almost a year he has had a rule pending before the Board of Health forbidding the wearing of long skirts. Until recently he has stood alone in advocating it, but Commissioner Thomas Meetan, of the Board, has now come out in favor of the rule, so that while the ordinance is still on the table, it is one vote nearer passage than ever before, and, besides, Deputy Sanitary Inspector John Nevins favors the measure.

The ordinance was referred to recently. It was recalled to mind when Mrs. Mary McCarthy, on complaint of a neighbor, was placed under $100 bonds not to offend again the neighbor's sense of propriety by displaying her stockings. The fact that the stockings alleged to have been displayed were white seemed to have some weight with the Recorder in determining the case.

Commissioner Meetan, after the meeting of the Board, said he did not favor a very short skirt, but one that would reach to the ankle, and possibly one that would clear the ground by about the same distance that the rear of men's trouser legs did. Mr. Meigs favors an even shorter skirt. Deputy Inspector Nevins, when asked what length he favored, said that from four to six inches from the ground was none too short from a sanitary point of view.

MORTALITY AND MORBIDITY REPORTS AND REVIEWS.

NEW YORK.—Summary of Population and Mortality for 1902: The Sanitary Districts into which the State is divided are as follows: 1. *Maritime District:* Includes New York, Brooklyn, Long Island, Staten Island and Westchester County. 2. *Hudson Valley District:* All the counties on either side of the Hudson River, except Westchester, to and including Albany and Rensselaer. 3. *Adirondack and Northern District:* The northern section of the State—the counties of Washington, Warren, Hamilton, Essex, Clinton, Franklin, St. Lawrence, Jefferson and Lewis. 4. *Mohawk Valley District:* Schenectady, Schoharie, Saratoga, Montgomery, Fulton, Herkimer and Oneida counties. 5. *Southern Tier District:* The seven counties along the southeast border of the State. 6. *East Central District:* Sullivan, Delaware, Otsego, Madison, Chenango, Onondaga and Cortland counties. 7. *West Central District:* Cayuga, Tompkins, Seneca, Schuyler, Ontario, Yates, Livingston, Genesee and Wyoming counties. 8. *Lake Ontario and Western District:* Oswego, Wayne, Monroe, Orleans, Niagara and Erie counties:

Districts.	Population.	Total number of Deaths.	Death rate per 1,000 pop'n of—	Deaths under five years.	Zymotics per 1,000 —all causes.	Typhoid Fever.	Croup and Diphtheria.	Acute Respiratory Diseases.	Consumption (pulmonary).	Smallpox.	Cancer.
1.....	3,948,906	73,325	18.6	25,494	170	809	2,111	11,798	8,080	322	2,557
2.....	690,000	11,070	16.0	2,150	100	251	175	1,279	1,180	14	497
3.....	394,772	4,981	13.0	937	90	99	46	459	521	9	229
4.....	419,973	6,086	15.0	1,252	100	84	121	631	517	2	282
5.....	429,530	5,811	14.0	987	95	101	121	574	431	6	259
6.....	402,660	5,481	14.0	852	70	72	44	514	482	—	306
7.....	316,000	4,448	14.0	593	70	50	83	430	341	6	246
8.....	876,206	12,292	14.0	2,930	125	252	208	1,030	1,030	83	624

The Principal Causes of Death for the Year.

Including 666 delayed returns of death there have been reported 124,160 deaths during the year, making a death-rate of 17.0 per thousand population. The number of deaths was that of the average of five preceding years, but was about 5,000 less than the mortality of 1901. The decrease from last year was participated in by all the sanitary districts; it occurred mostly in the winter months, but the midsummer mortality this year was unusually low.

The *infant mortality* is very low, almost 5,000 less than the average; the saving occurred in the autumn and in rural parts of the State. One-fourth of the deaths occurred under 5 years of age; *deaths over 70 years* of age ranged from 10 per cent. in the maritime to 30 per cent. in the central districts of the total.

The *zymotic mortality* was 14.0 per cent. of the total, being above the average. *Diarrhœal diseases* caused a very low summer mortality. *Scarlet fever* continues the abrupt increase of last year. *Diphtheria* has the same rate of the last four years, which is very much less than all preceding years. *Typhoid fever* increased moderately in the maritime and Hudson Valley districts.

Smallpox existed in the early months throughout the Adirondack region, where it has not recurred save to a limited extent this present winter. During the year the disease has developed in 135 municipalities in all parts of the State, the chief of which have been New York City, towns in Westchester County, Albany, Schenectady, Binghamton and southern border counties, Walton in Delaware County, Rochester, Buffalo, and towns in Chautauqua County. It was most prevalent during the first half of the year, with much decrease in the summer and recurrence during the fall. It caused the same mortality as in 1901, but was more extensively prevalent. It exists now at Rochester and vicinity, abating; and in towns in Clinton, Chautauqua and Delaware counties.

There were 8,800 deaths from *Pneumonia* and about 5,500 from *Bright's disease.* The acute Respiratory mortality was a little below the average. *Grippe* was estimated to cause 4,000 deaths in the early months of the year. Its annual recurrence in November and December has been moderate, causing probably not more than 500 deaths.

Disgraceful Treatment of Smallpox Patients.

Much of the testimony in the recent investigation of the treatment of smallpox patients in Rochester is of so grave a nature as to be unprintable. Conservative witnesses testify to conditions of filth and neglect almost unbelievable. Witnesses told of having been discharged with insufficient clothing. Miss Wave Bauer told of the Health Officer's having pulled a shirt from a little girl, with scabs from the upper part of the body coming off with it. Witness described the nurses as being "fly" and that Dr. Barron talked foolishly.

Another former patient said that when she went to the hospital, the bed assigned to her was full of oats and what looked to be fish scales. Still another witness told of seeing patients with maggots in their feet, awful conditions of uncleanliness, improperly cooked food and insufficient care. The stories told by witnesses have aroused great indignation throughout the community.

The Typhoid Fever Epidemic in Ithaca.

The calamity common to communities and officers of educational institutions who are purblind to neglected measures for the protection of the water supplies, has overtaken the citizens of Ithaca and Cornell University. The University authorities are now, February 20, since a hundred or more cases of typhoid fever and several deaths have occurred among the students, alive to the importance of immediately establishing on the campus pure water depots, where the students can obtain water which the University authorities guarantee shall be uncontaminated. And the city authorities are in like mood, with regard to the public safety, since the disease which first cropped out more than a month before is prevalent throughout the city and many deaths have occurred from it. And besides, what of the Board of Health and its reports to the Health Department of the State? Can it be that all of these authorities have been awaiting the test results of similar conditions demonstrated hundreds of times. Inspection of the water supply is a cardinal principal of sanitation everywhere, and had it been duly exercised and acted upon in this case, as it should have been, the epidemic would have been prevented.

New York City, 3,632,501. Report for the quarter ending September 30; Work performed by the Medical School Inspectors: Total daily average attendance, 447,238; school days, 15; schools visited, 588; visits, 4,632. Diseases for which children were excluded: Measles, 8; diphtheria, 9; scarlet fever, 22; whooping cough, 68; mumps, 28; contagious eye diseases, 3,316; parasitic diseases, 9, 187; chickenpox, 17; skin diseases, 499; miscellaneous, 275; total, 13,429. Abstract from report of Bureau of Records: Borough of Manhattan, 1,895,491: Deaths, 9,077; death-rate, 18.99. The Bronx, 244,141: Deaths, 1,237; death-rate, 20.11. Brooklyn, 1,249,650: Deaths, 5,864; death-rate, 18.63. Queens, 172,472: Deaths, 800; death-rate, 18.41. Richmond, 70,747: Deaths, 416; death-rate, 23.34. Deaths in institutions, 4,353; in tenements, 9,607; in dwellings, 2,948; in hotels and boarding houses, 115; in streets, rivers, etc., 329. Deaths of

children under five years of age, 7,720. From typhoid fever, in Manhattan, 111; Bronx, 10; Brooklyn, 107; Queens, 17; Richmond, 2.

The number of inspections and reinspections by the Sanitary Bureau was: By the Division of Inspection, 236,575; by the Division of Contagious Diseases, 37,352; by the Division of Bacteriology, 4,472; 278,399. The whole amount of work is consisely summed up.

Tents for Tuberculosis.

Dr. Lederle, President of the Board of Health, earnestly urges "the necessity for the establishment of a hospital or hospitals for the treatment of patients suffering with pulmonary tuberculosis. Dr. Herman N. Biggs, the chief medical official of the department, has submitted a new plan to me that meets with my approval. Instead of waiting a long time for the erection of a big building at great expense, he advocates a plan that will save valuable time to treat the poor who are now housed in tenements.

"He recommends the building of tents, about three feet of wood on the sides and the remainder of canvas. These tents would be about twenty-five feet square and would be large enough to accommodate two patients each. There would also be a veranda about them and lattice work, allowing the patients to sit outdoors. They could be built in good style and with little expense.

"I intend seeing the Mayor very soon and to submit the plans to him for his approval. I wish his opinion on the subject. We have a number of sites offered us, but at present I would rather not say where they are. The best thing in the plan is that these tent-like hospitals could be erected quickly and we would escape losing so much valuable time. They would also be very cheap."

Recent Druggists' Frauds for Profit.

Concerning an article in "The American Druggist and Pharmaceutical Record," to the effect that the analyses of the chemists of the Board of Health differed from those made by the College of Pharmacy as to the adulteration of *phenacetin*, President Lederle is reported to have said:

"I am willing to stand by the experiments made by the chemists of the Board of Health. Out of 280 specimens we found but 52 that were pure phenacetin. This is not always the fault of the druggist, nor of the wholesale dealer."

At a recent meeting of the Society of Medical Jurisprudence, Dr. H. W. Wiley, Chief of the Chemistry Division of the Department of Agriculture, commented on the New York Health Board's recent discovery that the substitution of acetanilid for phenacetin was common, saying that the former drug was much cheaper and more harmful to the system. A great evil he mentioned was the sale of patent medicines under wrong names, or with wrongly described formulas. It has become common for patent medicine makers to put alcohol in their mixtures without informing the consumer of the fact.

"Many of the names do not indicate that the preparations contain alcohol," he said, "and there is danger of the consumer contracting a drug habit that will bring him untold disaster. This has happened in a multitude of cases, and there ought to be a law covering the offense.

"The cocaine habit is acquired similarly. I had a letter the other day from a man who got it from a medicine, when he did not know the medicine contained the drug. He asked me if there was not some way in which the Government could afford protection from such a danger."

CALIFORNIA.—The latest case of plague reported in San Francisco, to the time of this writing, was December 11. At the conference of the Public Health and Marine Hospital Service and representatives of the State Board of Health, in Washington, January 19, *resolutions censuring the plague situation in San Francisco* were adopted, and action on them in San Francisco, as follows:

Resolutions of Mercantile Joint Committee.

SAN FRANCISCO, Cal., February 2, 1903.

Whereas, The Boards of Health of other States and Territories have become alarmed at the reports of bubonic plague in San Francisco during the past three years; and

Whereas, But 93 cases have been reported by all health authorities during a period of these thirty-five months, and that the last case reported was December 11, 1902; and

Whereas, The health authorities of 21 States and Territories, in a conference called for that purpose at Washington, January 19, declared that the presence of plague had "been established beyond debate by the investigations of Kellogg, of the City Board; by

Pillsbury and Ryfkogel, of the State Board; by J. White, M. White, Flint, Currie, Carmichael, Blue, and Glennan, of the Public Health and Marine Hospital Service; by Flexner, Barker, and Novy, a special commission acting under Federal authority; by independent and disinterested investigators in Chicago, Boston, New York, Washington, Baltimore, Philadelphia, and Ann Arbor, working from material obtained in San Francisco; by a case of human plague in Ann Arbor due to an accident in the handling of a culture of plague bacillus obtained in California, and said plague conference did attempt to declare a quarantine against California, to cause the transport service to be removed from San Francisco, and to place medical inspectors upon all the trains going out of the State, and but for the most strenuous efforts of Dr. Gardner, representative of the State Board of Health, could have succeeded in so doing; and

Whereas, Said conference did demand that the city and State health authorities act in harmony with the Public Health and Marine Hospital Service to carry out any sanitary regulations which that Service may deem necessary, or quarantine would be established against California, at its next meeting, to be held in April; and

Whereas, The great interests of California and especially those of San Francisco, demand that no neglect of our citizens should hinder the march of progress which has now been so happily begun; it is, therefore

Resolved, That this mercantile joint committee, consisting of the officers and other representatives of the State Board of Trade, the San Francisco Board of Trade, the San Francisco Chamber of Commerce, the Merchants' Association of San Francisco, the Merchants' Exchange of San Francisco, the Manufacturers and Producers' Association of California, and the California Promotion Committee, hereby strongly urges the Governor of the State and the Mayor and Supervisors of San Francisco to take such steps at once as shall secure a prompt co-operation of the Boards of Health of the city and the State, under the supervision of the Public Health and Marine Hospital Service, to the end that all danger from the bubonic plague may be eradicated; that all fears of infection may be removed; that the confidence of the Boards of Health of the other States and Territories may be restored, and that no injury, however remote, may result to the foreign and interstate commerce, and to this end we hereby pledge to the

officials of the State and city every aid and support of the various commercial bodies which we represent; and we also ask that the Governor of the State and the Mayor of the city join in the signing of the following statement·

Whereas, Competenf medical authority has declared that bubonic pest has existed to a limited extent in the restricted area known as Chinatown in San Francisco, the last case having been reported December 11, 1902, and although the health authorities have exercised sanitary supervision over this section in the past,

Nevertheless, this undersigned joint official statement is promulgated in accordance with the resolutions adopted at the conference of State health officers, held at Washington, D. C., January 19, 1903, as an assurance that there is no present or future danger from that disease, inasmuch as complete and harmonious action by all the health authorities concerned is hereby assured and will be maintained.

MERCANTILE JOINT COMMITTEE.

L. M. KING, *Secretary.*

FRANK J. SYMMES, *Chairman.*

Representing California State Board of Trade, San Francisco Board of Trade, San Francisco Chamber of Commerce, Merchants' Association of San Francisco, Merchants' Exchange of San Francisco, Manufacturers and Producers' Association of California, California Promotion Committee.

[No. 2.]

Supplementary Official Statement.

SAN FRANCISCO, Cal., February 2, 1903.

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by all the health authorities concerned is hereby assured, and will be maintained.

GEO. C. PARDEE,
Governor.
M. GARDNER, M. D.,
Representative State Board of Health.
E. E. SCHMITZ,
Mayor, San Francisco.
A. P. O'BRIEN, M. D.,
Health Officer, San Francisco.
A. H. GLENNAN,
Surgeon, Public Health and Marine Hospital Service.
ARTHUR R. BRIGGS,
Vice-President California State Board of Trade.
A. A. WATKINS,
President San Francisco Board of Trade.
GEORGE A. NEWHALL,
President San Francisco Chamber of Commerce.
FRANK J. SYMMES,
President Merchants' Association of San Francisco.
GEORGE W. MCNEAR,
President Merchants' Exchange of San Francisco.
A. SBARBORO,
Manufacturers and Producers' Association of California.
RUFUS P. JENNINGS,
California Promotion Committee.

Los Angeles, 135,000. Report for January: Deaths, 256—38 under 5 years. From diphtheria, 7; scarlet fever, 6; typhoid fever, 1. There were 68 deaths from tuberculosis, divided as follows: Natives of Los Angeles, 4; natives of the Pacific Coast outside of Los Angeles, 6; from other parts, 58; 12 had lived here less than three months, 2 between three and six months, 4 between six and twelve months, 18 between one and five years, 6 between five and ten years, 19 over ten years, 7 life."

COLORADO.—Denver, 150,000. Report for December, 1902: Deaths, 242—50 under five years. Premature and still births, 10; from phthisis, 53—49 contracted elsewhere; diphtheria, 15; typhoid fever, 3; erysipelas, 3; scarlet fever, 2. Death-rate, 15.44. Cases of infectious disease reported: Diphtheria, 96; scarlet fever,

25; measles, 4; typhoid fever, 1; smallpox, 28; erysipelas, 5; chickenpox, 1.

CONNECTICUT.—Mortality report, as per bulletin for January, 1,418, 120 more than in December, 246 more than in January of last year, and 78 more than the average number of deaths in January for the five years preceding. The death-rate was 19.1 for the large towns, for the small towns 17.4, and for the whole State 18.7. The deaths reported from infectious diseases, including diarrhœal, were 289, being 20.3 per cent. of the total mortality.

Cases of infectious diseases reported: Smallpox, in 8 towns, 73; measles, in 60 towns, 822; scarlet fever, in 53 towns, 246; diphtheria, in 38 towns, 161; whooping cough, in 32 towns, 212; typhoid fever, in 18 towns, 38; consumption in 12 towns, 19.

DELAWARE.—January bulletin reports quite a severe epidemic of typhoid fever has been raging in the city of Wilmington. The source of this rather widespread epidemic is, of course, not difficult to locate. We have repeatedly pointed out the inefficacy of the Wilmington city filter, and the present epidemic is simply the result of contamination of the Brandywine, the contamination not being removed by the process of straining. It is gratifying to note the effort made by the City Council and Water Commissioners to secure the establishment of a modern filter plant which is estimated to cost about $500,000, the expense to be covered by the yearly surplus on the water rents. The people of Wilmington should rejoice at the prospect of having a pure water supply which implies freedom from typhoid fever and other diseases caused by contaminated water.

DISTRICT OF COLUMBIA, 293,367—89,632 colored. Report for the week ending February 17: Deaths, 149. Death rates, white, 19.7; colored, 41.7: 265. Deaths from consumption, 4; pneumonia, 1; congestion of lungs, 4; typhoid fever, 1.

INDIANA.—The number of deaths reported to the State Board of Health for January was 2,910; death rate of 13.6. The greatest number of deaths, 410, was caused by pneumonia. January generally shows very few typhoid deaths, and there is no exception this time. The number was 64. Diphtheria caused 53 deaths, scarlet fever 23, whooping cough 19, cerebrospinal meningitis 33, influenza 39, cancer 88, violence 129, smallpox 50. The city

death rate was 16.8, and the country death rate 11.9. In the following diseases the city death rate was higher than the country death rate: Tuberculosis, typhoid fever, diphtheria, pneumonia, cancer, violence, smallpox. In the country there was a higher death rate as compared with the cities for the following diseases: Scarlet fever, whooping cough, diarrhœal diseases, influenza and puerperal fever. Compared with January, 1902, there is an increase of .4 in the death rate for January, 1903. There is a decrease in the death rate from consumption of 16.4 in 100,000. There is also a decrease in typhoid fever, pneumonia, influenza, violence and smallpox. There were only 5 deaths from smallpox in January, 1902, which compared with 50 in January, 1903, shows a very great increase.

Disease prevalence during the month, smallpox leads the list, 63 localities, 921 cases, with 50 deaths. The increase in smallpox as compared with the corresponding month last year is enormous and was predicted by this Board. We find a 98 per cent. increase in number of cases, 80 per cent. increase in area covered, and 900 per cent. increase in the number of deaths.

The order of prevalence of diseases was as follows: Smallpox, tonsillitis, bronchitis, pneumonia, rheumatism, influenza, typhoid fever, scarlet fever, pleuritis, diarrhœa, intermittent fever, diphtheria and croup, erysipelas, whooping cough, measles, inflammation of bowels, puerperal fever, dysentery, cerebrospinal meningitis, cholera infantum, cholera morbus.

ILLINOIS.—Chicago.—Statement of mortality for the week ended February 14, 1903, compared with the preceding week and with the corresponding week of 1902. Death rates computed on estimated populations of 1,855,000 for 1903, 1,820,000 for 1902: Total deaths from all causes, February 14, 1903, 634; February 7, 1903, 556; February 15, 1902, 542. Annual death rate, February 14, 1903, 17.56; February 7, 1903, 16.48; February 15, 1902, 15.52. Under one year of age, February 14, 1903, 111; February 7, 1903, 105; February 15, 1902, 120. Between one and five, February 14, 1903, 81; February 7, 1903, 67; February 15, 1902, 46. From Bronchitis, February 14, 1903, 30; February 7, 1903, 28; February 15, 1902, 41. Consumption, February 14, 1903, 56; February 7, 1903, 54; February 15, 1902, 61. Cancer, February 14, 1903, 18; February 7, 1903, 22; February 15, 1902, 23. Pneumonia, February 14, 1903, 147; February 7, 1903, 127; February 15, 1902, 95. Typhoid fever, February 14, 1903, 10:

February 7, 1903, 11; February 15, 1902, 3. Scarlet fever, February 14, 1903, 8; February 7, 1903, 9; February 15, 1902, 13. Suicide, February 14, 1903, 13; February 7, 1903, 9; February 15, 1902, 1. Violence other than suicide, February 14, 1903, 29; February 7, 1903, 18; February 15, 1902, 18. Smallpox, February 14, 1903, 5; February 7, 1903, 0; February 15, 1902, 0. Whooping cough, February 14, 1903, 14; February 7, 1903, 3; February 15, 1902, 1.

IOWA.—Outbreaks of infectious diseases were reported to the Secretary of the State Board of Health during December as follows: Diphtheria in 9 localities; measles, 2; scarlet fever, 12; smallpox, 24 localities, 144 cases; typhoid fever, 2.

KANSAS.—During the month of December there were reported to the Secretary of the State Board of Health from county health physicians, 27 cases of *smallpox*, with 1 death. One year ago there were 380 cases during the corresponding month. "We feel that the epidemic of smallpox that has prevailed in this State the past three years is at an end, and the cases are now entirely sporadic. Other health conditions are fairly good. In some counties there has been rather an unusual amount of scarlet fever, and late in 1902 diphtheria prevailed to some extent."

LOUISIANA.—New Orleans, 310,000—83,000 colored. Report for January: Total deaths, 580—214 colored; 99 under 5 years —43 colored. Annual death rate, white, 19.40; colored, 30.84: 22.49. Deaths from typhoid fever, 5—1 colored; diphtheria and croup, 2; pneumonia, white, 40; colored, 39; tuberculosis of the lungs, white, 32; colored, 30; Bright's disease, white, 28; colored, 15; cancer, 19—3 colored.

MARYLAND.—Health Commissioner Bosley's report for 1902 shows 10,253 deaths, as compared with 10,700 for 1900 and 10,479 for 1901. The annual death rate per 1,000 was 18.70, being for the whites alone 16.53, and for the colored 30.76. The death rate was one per cent. less than that of the two previous years. There were 3,327 deaths under 5 years, or 32.45 per cent. of the entire number. Among death causes pulmonary tuberculosis leads, with 1,159; pneumonia has 1,010; heart disease, 716; diarrhœa and enteritis (under 5, 695; over 5, 82); Bright's disease, 659; cancer,

384; typhoid fever, 220; diphtheria, 99; whooping cough, 95; measles, 41; scarlet fever, 37; smallpox, 7.

MASSACHUSETTS.—Boston, 590,937. Report for November, 1902: Deaths, 919—292 under 5 years; still births, 50; death rate, 18.66. Deaths from typhoid fever, 17; smallpox, 21; scarlatina, 11; whooping cough, 12; diphtheria, 22; tubercle of the lungs, 93; organic diseases of the heart, 81; bronchitis, 41; pneumonia, 73; broncho-pneumonia, 40; acute nephritis, 31; Bright's disease, 18. Contagious diseases reported: Chickenpox, 58; cerebrospinal meningitis, 1; diphtheria and croup, 207; tuberculosis, 86; measles, 22; scarlatina, 114; smallpox, 83; typhoid fever, 119.

MICHIGAN.—The Secretary of the State Board of Health reports for January, 1903, compared with the preceding month, inflammation of kidney, smallpox and measles were more prevalent; and erysipelas and diphtheria were less prevalent. For the month of January, 1903, compared with the average for January in the 10 years, 1893-1902, smallpox, measles and whooping cough were more than usually prevalent; and consumption, intermittent fever, remittent fever and diphtheria were less than usually prevalent. Of the diseases most prevalent in Michigan during January, 1903, bronchitis heads the list, not from this disease having caused unusual sickness, because it did not, but from the less than average prevalence of influenza and rheumatism, which, had they been as prevalent as usual, would have headed the list, with bronchitis third in order.

Of the most dangerous communicable diseases, reports from all sources show *meningitis* reported at 3 places less; *whooping cough* at 2 places less; *diphtheria* at 33 places less; *typhoid fever* at 15 places less; *measles* at 38 places more; *scarlet fever* at 8 places more; *smallpox* at 90 places more, and *consumption* at 30 places more, in the month of January, 1903, than in the preceding month.

The number of deaths returned to the Department of State for the month of January, was 2,856; death rate of 13.5. The number returned was 190 more than that registered for the preceding month, and 32 more than the number registered for January, 1902. There were 550 deaths of infants under 1 year, 178 from 1 to 4 years, both inclusive, and 906 deaths of elderly persons, aged over 65 years. Important causes of death were as follows: Tuberculosis of lungs, 170; other forms of tuberculosis, 25; typhoid fever, 48; diphtheria and croup, 58; scarlet fever, 36; measles, 13;

whooping cough, 40; smallpox, 7; pneumonia, 382; influenza, 39; cancer, 140; accidents and violence, 126. Typhoid fever and diphtheria slightly decreased in the number of deaths as compared with December. The deaths from external causes were also considerably less. Scarlet fever and whooping cough showed marked amounts of increase. Pneumonia was considerably more fatal, and the number of deaths from cancer exceeded any month during the previous year.

Summary of Mortality for the Year 1902.

The total number of deaths registered, 30,962, corresponding to a death rate of 12.6 per 1,000 estimated population. For the year 1901, the number of deaths registered was 33,848, and the death rate was 14.0. There were 2,886 fewer deaths registered for 1902 than for the preceding year.

MINNESOTA.—Minneapolis, 240,000. Registry of deaths for January, 1903: Deaths, 196—39 under five years; death rate for year ending January 31, 9.45. Deaths from typhoid fever, 7; tubercle of the lungs, 23; other forms of tuberculosis, 5; diphtheria and croup, 8; cancer, 15; pneumonia, 25.

St. Paul, 175,000.—Report for January, 1903: Deaths, 134—40 under five years; death rate, 9.18; deaths from typhoid fever, 3; diphtheria, 5; tuberculosis of the lungs, 12; tuberculosis, 7; cancer, 5.

NEW HAMPSHIRE.—State Board of Health bulletin for January calls attention to and specifies some so-called compound foods. For example: "Coffee compound" sold for sixty cents per pound, or for nearly twice as much as the best grades of pure coffee. An analysis showed it to be composed of high-grade coffee mixed with a small quantity of chicory and roasted peas and containing as the "antidote" one-half of one per cent. of common salt. The peas and chicory were doubtless added, not to improve its flavor, but to make the coffee come in the class of compounds and thus evade the law against the adulteration of foods, which states specifically that "if any food or substance to be eaten or used in the manner of food or drink contains any substance foreign to the well-known article under whose name it is sold, it shall be deemed to be adulterated."

The salt present is in no way an antidote for the caffein, or alkaloid of the coffee, the principle to which the injurious effects

of excessive coffee drinking are ascribed. This "Antidote coffee" is plainly intended to deceive the purchaser into thinking he is buying an article which can be used without harm when pure coffee proves injurious. As a matter of fact, its effects will be exactly the same as those produced by pure coffee, and the consumer is doubly defrauded, since he is not only paying twice what the coffee is worth, but also because he is given an article which does not in any way possess the virtues claimed for it.

This is but one instance of many that might be cited which goes to show the value of constant supervision of food products and the need of explicit laws regulating their sale.

NEW JERSEY.—Hudson County (Jersey City and environs), 409,810. Report for December, 1902: Deaths, 594—160 under five years; death rate, 17.4; deaths from diphtheria and croup, 25; typhoid fever, 5; all zymotic diseases, 60; consumption, 77; bronchitis, 17; pneumonia, 86.

Newark, 266,000. Report for the week ending February 13: Deaths, 108—26 under 5 years; death rate, 21.11. Deaths from scarlet fever, 2; phthisis, 11; bronchitis, 7; broncho-pneumonia, 3; pneumonia, 8; cancer, 1. Contagious and infectious diseases reported: Diphtherian-croup, 29; scarlet fever, 10; typhoid fever, 8; smallpox, 2.

NORTH CAROLINA.—Bulletin of State Board reports for December, 1902: Twenty-six towns with an aggregate population of white, 83,300; colored, 58,800: 142,100. Aggregate deaths, 220 —117 colored; 58 under five years of age; still born, 26. Death rates, white, 14.8; colored, 23.9: 18.0.

Deaths from typhoid fever, 6; malarial fever, 3; consumption, 29; pneumonia, 25; smallpox reported in 27 counties, an aggregate of 44 cases, no deaths.

OHIO.—Sanitary bulletin sums up for seven weeks ending December 27, 1902—66 localities, with an aggregate population of 1,286,269: Diphtheria and croup, 718 cases, 100 deaths; scarlatina, 421 cases, 39 deaths; typhoid fever, 310 cases, 63 deaths; whooping cough, 51 cases, 4 deaths; measles, 173 cases, 2 deaths; smallpox, June 1 to December 31, 3,405 cases, 303 deaths.

Cleveland, 400,000. Report for January, 1903: Deaths, 606—229 under 5 years; annual death rate, 15.33. Deaths from typhoid fever, 32; smallpox, 9; diphtheria and croup, 29; tuberculosis of

lungs, 53; bronchitis, 17; pneumonia, 61; heart disease, 29, Bright's disease, 9; cancer, 24.

PENNSYLVANIA.—Philadelphia, 1,349,712. Report for week ended February 14, 1903: Deaths, 558—139 under five years. Deaths from consumption, 62; typhoid fever, 21; diphtheria and croup, 11; whooping cough, 9; smallpox, 2; cancer, 21.

Pittsburg, 354,000. Report of the Bureau of Health for week ended February 7, 1903: Deaths, 134—45 under five years; annual death rate, 19.68. Deaths from typhoid fever, 10; smallpox, 3; consumption, 6; pneumonia, 18; cancer, 5.

Cases of infectious disease reported: Smallpox, 18; diphtheria and croup, 16; scarlet fever, 5; typhoid fever, 30.

WASHINGTON.—Seattle, 115,000. Report of the Department of Health for December, 1902: Total number of deaths, 77—7 under five years. Death rate, 8.04. Deaths from pulmonary consumption, 7; pneumonia, 7; typhoid fever, 3; cancer, 5.

WISCONSIN.—Milwaukee, 300,000. Report for December, 1902: Deaths, 362—136 under five years. Annual death rate, 14.48. Deaths from typhoid fever, 5; whooping cough, 7; measles, 2; diphtheria and croup, 13; tubercular diseases, 45; cancer, 15.

Cases of infectious disease reported: Smallpox, 21; tuberculosis, 2; diphtheria, 59; scarlatina, 20; typhoid fever, 10.

PORTO RICO, 953,947. Superior Board of Health reports for December, 1902: Total deaths, 2,207—819 under five years. Death rate, 27.4; still births, 120. Deaths from cerebrospinal fever, 16; diphtheria, 5; typhoid fever, 4; pneumonia, 55; puerperal fever, 13; diarrhœal diseases, 39; anemia, 621; bronchitis, 111; tuberculosis, 108; heart diseases, 30; accidents and violence, 27.

CUBA.—Havana, 275,000—73,000 colored. The Chief Sanitary Officer reports for December, 1902: Total mortality, 457—120 under five years. Annual death rate, 19.55. Deaths from typhoid fever, 1; tetanus, 11; tuberculosis of lungs, 77; pneumonia, 15; broncho-pneumonia. 13; cancer, 12.

CITY OF MEXICO, 368,777. Bulletin for August, 1902: Deaths, 1,522—654 under 5 years. Annual death rate, 49.0. Deaths

from prevailing causes: Tuberculosis, 166; bronchitis, 61; pneumonia, 74; broncho-pneumonia, 44; typhus fever, 60; cirrhosis of liver, 69; diarrhœa and enteritis, 453.

200 DEATHS FROM PLAGUE.

WASHINGTON, February 7.—United States Consul Kaiser, at Mazatlan, Mexico, has advised the State Department that the total deaths from plague to February 1 is 200 and that the total number of cases to date is 260.

GERMAN TUBERCULOSIS REPORT.

The Imperial Chancellor, Count von Bülow, sent to the Reichstag, February 16, a memorandum on tuberculosis treatment in which he recited facts gathered by the Imperial Health Office, as follows:

Out of 1,000 deaths in Germany of persons between the ages of fifteen and sixty, 316 are from tuberculosis. Persons under fifteen and over sixty are seldom affected. The mortality of the whole population has averaged 242 per 100,000 yearly, rising in the Bavarian Palatinate to 329, in Bremen to 337, and in Hesse to 314. The conditions in Germany are shown to be better than in France, Austria and Russia, but worse than in Switzerland, Belgium, Denmark, Norway, and, especially, England.

The Chancellor says the Health Office has found that consumption can best be treated in special hospitals, in which Germany now has accommodation for 30,000 patients.

The statistics for 1896 to 1901 show that, on the average, out of 100 cases treated, 87.7 were dismissed as cured or improved, 8.8 as no better, 3.1 as worse, and that 0.4 died.

In concluding, the Chancellor says it is hoped that the war against tuberculosis will make further progress through the co-operation of individuals and public bodies with the Government.

CREW OF GUNBOAT POISONED BY FISH.

News has reached the Navy Department from Tutuila, Samoan Islands, that on January 14 fifteen of the crew of the gunboat Wheeling were poisoned by eating fish caught over the ship's side. While no cases have proved fatal some half dozen were on January 26 slowly recovering from the effects. One case was making very slow progress.

BOOK REVIEWS.

REPORT OF THE CHIEF OF WEATHER BUREAU, 1901-1902, is a quarto-compilation of the observations of the weather service for the period elucidated by charts of the field of view, preceded by a chapter on Forecasts and Warnings, briefly describing the most important storms, their relations to the regions over which they passed and the importance of the warnings to commerce and agriculture.

Much attention has been given to the daily forecasts and their distribution throughout the country, insomuch that there were in operation August 1, 1902, 10,025 rural free-library routes serving approximately 1,000,000 families, of which but 105,000 families (about 10 per cent.) served by about 1,000 routes, could be furnished with the forecasts of the Weather Bureau from the funds available for that purpose. The Post-office Department estimates that there will be in operation by July 1, 1903, 15,000 routes, serving approximately 1,500,000 families. For the distribution of forecasts by this means alone it would require not less than 450,000,000 blank forms for the routes that will be in operation July 1, 1903. The magnitude of the work is shown by a statement of its geographic extent through all the States and Territories.

The weather service in Cuba to which the work of the Bureau had been extended, has been turned over to the Secretary of Agriculture of the Cuban Republic. It consists of 25 voluntary observation stations, each one of which being well equipped with the needful instruments, and with 86 crop correspondents.

The "Monthly Weather Review" continues to be the recognized medium for the diffusion of knowledge of the results of the work in all branches of climatology and meteorology, of pre-eminent practical utility to all who would keep abreast with meteorological knowledge.

EIGHTEENTH ANNUAL REPORT OF THE BUREAU OF ANIMAL INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE, 1901. 8vo, pp. 706.—A comprehensive volume of investigations and papers on animal diseases, many of them closely related and all more or less to measures necessary for the prevention of diseases to which

mankind are liable. A few of them it has been the privilege of THE SANITARIAN to reproduce, during and since the period covered by the report, and it hopes for space to reproduce some others hereafter. Particularly noteworthy are "Tuberculosis of Animals in Some of Its Relations to Human Tuberculosis" and "Food Products from Diseased Animals," by D. E. Salmon, D.V.M., Chief of the Bureau; "The Significance of the Recent American Cases of Book-worm Disease (uncinariasis, or anchylostomiasis) in Man," by Ch. Wardell Stiles, Ph.D.; "Cattle Markets and Abattoirs in Europe," by Henry Alvord, C. E., and several others. Indeed, the volume throughout is replete with matter of practical interest to sanitarians.

REPORT OF THE COMMISSIONER OF EDUCATION, 1900-1901. Vol. I., 8vo, pp. cxii-1216.

No review of this volume of available space in these pages can adequately represent it. It comprehends the enrollment of 17,299,230 pupils, an increase of 278,520 over the previous year, in schools and colleges, and besides these, the enrollment in special schools and institutions aggregating 563,350 more. The enumeration of teachers follows: Women, 306,063, from 122,986 thirty-one years ago; and of men, 132,257, in 1898, from 77,529 in 1870. The ratio of male to female teachers has declined from 42.8 in 1880 to 28.8 per cent. in 1901. The aggregate of school property is nearly $577,000,000, having increased to that amount from $130,000,000, reported in 1870. Statistics in detail follow: The common schools; average amount of schooling per inhabitant; education in Central Europe; Noire's logos theory; international association for the advancement of science, arts and education; biological contributions to educational theory; German instruction in American schools; education of the negro; education in Great Britain and Ireland; temperance instruction; the Carnegie Institution; education in France; higher commercial education; coeducation of the sexes; the Philippines; introduction of reindeer into Alaska; city school system; higher education; secondary schools; education in Porto Rico; Hawaii; Cuba.

DISEASES OF METABOLISM AND NUTRITION.—A SERIES OF MONOGRAPHS BY PROF. DR. CARL VON NOORDEN, Physician-in-Chief to the City Hospital, Frankfort-on-Main. AUTHORIZED AMERICAN EDITION. Edited by BOARDMAN REED, M. D., Philadelphia.

PART I.—OBESITY, the Indications for Reduction Cures, founded upon a critical scientific study, by this eminent pathologist and clinician. Small 8vo, cloth, 50c. E. B. TREAT & Co., Publishers, New York.

A common-sense treatise, based upon physio-pathological knowledge. The treatment here described may be pursued without injury to health; and for that, as compared with most treatments of obesity, of one kind or another, it is commendable. And the more, because, as the author well says: "Simple and clear as the matter lies in uncomplicated obesity, the question becomes difficult and complicated in obesity combined with other diseases." It is not a handbook for laymen, but for physicians.

PART II.—NEPHRITIS. The same author. His treatment of the various forms of Bright's disease are based on exhaustive experiments and bed-side observations. Cloth, $1.00. E. B. TREAT & Co., Publishers, New York.

This little treatise fully justifies what is said of it by the American editor: "The author is bold, original and somewhat iconoclastic. He has by actual experiments exploded the myth so long accepted, that the light meats are safer than the dark ones in various diseases, including nephritis. He has questioned and gone far toward disproving the theory that milk is the best diet in all cases of nephritis." So prevalent is the disease of which this little book treats, no physician can very well afford to do without it.

QUIZ-COMPEND OF DISEASES OF CHILDREN, ESPECIALLY ADAPTED FOR THE USE OF MEDICAL STUDENTS.—By Marcus P. Hatfield, A. M., M. D. Third edition. Thoroughly revised. 12mo, p. 241. Price, 80c. P. BLAKISTON, SON & Co., Philadelphia.

This is an excellent book of its kind; the gist of the subject, comprehensive but terse.

IMPORTANT BOOKS FORTHCOMING.

An American edition of Muir and Ritchie's standard text-book, "Manual of Bacteriology," has been prepared by Norman MacL. Harris, M. B., Associate Professor in Bacteriology at John Hopkins University, from the third and latest revised English edition. It will be profusely illustrated.

Professor Harris's edition will bring the book up-to-date and will add the very important share of the research which is to the

credit of America. The revision by Dr. Harris will include a complete American bibliography as well as the necessary change of text to bring the whole work up-to-date from an American point of view and fit it completely for American students. It has already been looked upon generally as one of the very best manuals, and it is likely to take the front rank in its field under Dr. Harris's able revision. This American edition will contain many new illustrations of plates and apparatus.

There has long been serious need for just such a book as "Athletics and Outdoor Sports for Women," which The Macmillan Company will publish next month. Among that large and growing class of women who live in the open air half the year, and also among women who have charge of the physical training in colleges, and among those who want to know how to live a healthy outdoor life, such a book will be of great value.

Mr. Hal Williams' work on "Mechanical Refrigeration" will be a practical introduction to the study of Cold Storage, Ice Making, and other forms of refrigeration. It will be issued next month by The Macmillan Company and will contain 115 illustrations of machinery and appliances. Both theory and practice have been fully treated by Mr. Williams with the intention of showing not only what *is* practicable but what is *not* possible by the applications of scientific methods and discoveries.

The Abbey Press will shortly publish an illustrated book of considerable historical interest, entitled "Stories of Old New Haven." The author, Ernest H. Baldwin, Ph.D., is a lecturer in History at Yale University, and himself a native of New Haven. Being a descendant of one of the original settlers of Quinnipiac, he has spent most of his life amongst the scenes which he describes. Dr. Baldwin has made many contributions to historical literature, amongst the most important being the biography of "Joseph Galloway, the Loyalist Politician."

W. B. Saunders & Co. announce that they have established a branch of their business in New York. For this purpose they have secured a suite of rooms in the Fuller Building, centrally located and easily accessible from all parts of the city. Dr. Reed B. Granger, for many years managing editor of the "New York Medical Journal," together with a representative who is thoroughly familiar with the methods of the Philadelphia house, will

be connected with this new branch; and Mr. W. B. Saunders personally will divide his time between New York and Philadelphia.

The Fuller Building, erected on the triangular plot bounded by Broadway, Fifth avenue, Twenty-second and Twenty-third streets, is one of the oddest structures in the world, and because of its peculiar shape is known as the "Flatiron Building." From the offices, purposely located on the seventeenth floor, can be obtained an unobstructed panoramic view of the city. Physicians visiting New York are cordially invited to make these conveniently appointed offices their headquarters, where they can receive and answer their correspondence, obtain an interesting panoramic view of the city from a most favorable point, and where they will always be courteously welcomed.

CONTEMPORARY LITERATURE.

THE LITERARY PILGRIM'S REWARD.

"Out of the abundance of the heart the mouth speaketh," says the sensitive city; "and, as all literature is a confession, the pilgrim's printed narrative bespeaks an evil heart." The world is forthwith combed for corroborative evidence, and wherever the pilgrim has been in former days they look for dark tales of him. Was he once a clergyman? They call him "ex-parson," "heretic," "renegade." Did he ever work any good? They brand him as "reformer." Is he young? They picture him "an irresponsible enfant terrible,"—a smart upstart eager to make a sensation. Old? He is verging toward "second childishness and mere oblivion." Is he single? A heartless clod. Married? Presumably henpecked. Is he college-bred? An intellectual snob. A non-university man? Incompetent to handle so serious a matter. Has he published books? They tatter them to rags. If he stood for high office or sat in the glare of "that fierce light which beats upon a throne," he would not be more pitilessly exposed to contumely and public slander. The upshot is this: a vicious man with a malicious motive has entered the innocent city, taken the municipal skeleton out of its closet, and dangled it for hire before the world—whereas God knows there is no such skeleton! "Liar," "traducer," "spy," "enemy of society,"—these dainty epithets look well in the headlines. The columns thus cap-

tioned get clipped and reprinted all over the country.—Rollin Lynde Hartt, in the "February Atlantic."

Seven important men are discussed in the February number of "The Cosmopolitan": "The Young Napoleon," by Field-Marshal Viscount Wolseley; "Leo Tolstoy: An Interpretation Done in Little," by Elbert Hubbard; August Belmont, by R. H. Graves; Henry M. Whitney, by A. E. MacFarlane; "The Triumphal Tour of Adolf Lorenz," by John Brisben Walker; William Andrews Clark, by H. R. Knapp; and "President McKinley's Tours," by W. W. Price.

GREATEST OF ALL.—A FATHER'S LOVE FOR HIS DAUGHTER.

"The love of a father for his daughter is, I think, the very purest love that earth can know, the love that comes the nearest to what we all imagine the divine love to be. The love of a husband for his wife when it endures the storm and stress which mark the period of mutual adaptation, is wonderfully beautiful; yet it had its birth in passion, and the memories of its early years remain to keep it very human. The love that is given to a father or a mother is strong and deep and lasting; yet it lacks the exaltation and supreme emotion which are necessary to the love that has no flaw. The love of a father for his son is intense and over-mastering; yet there is a touch of personal pride, of almost conscious egoism, in it, which renders it not wholly selfless and serene. But the love of a father for the girl child who has been born to him is more than any other love on earth, in its purity, its unalterable constancy, its power of self-sacrifice, its profound delight, and its infinite tenderness."—H. T. Peck, in the February "Cosmopolitan."

WELLESLEY COLLEGE UNDER THE ADMINISTRATION OF PRESIDENT FREEMAN.

As an administrator, Miss Freeman saw to it that both teachers and pupils were held to higher standards of scholarship. She set about establishing direct and indirect relations with secondary schools, seeing to it that thus the college should have a perennial supply of girls fitted to enter it. She simplified and better co-ordinated the courses of study. She arranged that the faculty should have due recognition as the teaching body, and thus she ministered to the professors' self-respect. Being from her childhood deeply religious and evangelistic in spirit, she insisted that religion should have its due place in the life of the students. As

the daughter of a physician, she knew the importance to women of health, and set about organizing the department of physical culture and providing for that side of Wellesley's life which made it peerless among women's colleges. Being wise as well as learned, and having that happy blending of ideality and practicality which is a characteristic American trait—discerning European students of our civilization being witnesses—she soon won the confidence of men of wealth and influence, and money for buildings, apparatus, and endowment began to flow in.

Last, but not least, being a winning and informing speaker, and having a persuasive power and an engaging personality, the new president, by her numerous addresses before assemblies of teachers, philanthropists, and men of affairs, attracted to Wellesley the friends and students it needed, and thus made its place secure. Life at the college took on a richer social quality, the institutional horizon widened, and all the time hundreds of young women were going forth to be mothers, teachers, missionaries, physicians, and authors, bearing with them the never-to-be forgotten influence of Miss Freeman's "effluent gladness," infectious idealism and optimism, and dauntless courage. Moreover, that spirit of helpfulness which, as Miss Hazard, now president of Wellesley, has pointed out, was instinctive with Miss Freeman, became the acquired spirit of the Wellesley alumnæ.—From a character sketch of "Alice Freeman Palmer," by George Perry Morris, in the "American Monthly Review of Reviews" for February.

THEY STUDY AT HOME.

In Germany the law requires that every child attend school from the age of six up to fourteen. Parents are compelled to pay a fine in court if their children are absent from school without good cause, and the child must make up the time lost by just as many extra days at the end of his course as he has been absent. Children are called by their last names from the very first of their school-days. Their teachers are men almost without exception. The hours for attendance in the winter are from eight to twelve in the morning, and from two to four in the afternoon; and in the warmer months from seven to eleven and from two to four. These hours are shortened for the younger children. On Wednesday and Saturday afternoons the schools are closed. What seems strange to us is that all studying is done out of school. A class not having a recitation, therefore, is sent home, and so it happens that few children are all of the six hours a day in school, as the

above hours would seem to indicate. The very little ones, for instance, may be in school from eight to nine, from eleven to twelve, and from two to three, the intervening time being spent at home in play or study. In consequence of this out-of-school study, all books, pencils, and stationery are taken home at the close of the morning and afternoon sessions. This has given rise to the use of knapsacks by both girls and boys. These knapsacks are made of leather either dressed or with the hair on.

If a boy intends to carry his education beyond that afforded by the grammar school, he is expected to enter the high school at the age of nine or ten years, where his lower-school studies are continued and languages are commenced in a simple way. Girls in like manner go to a higher school. The studies pursued in German schools are much the same as in our own.—From Charles Walter Gerould's "Child Life in Germany," in February "St. Nicholas."

THE "NEW WOMAN,"

Her advocates say, enjoys a larger life, notwithstanding her specialized labor, than her drudging grandmother enjoyed with her mental horizon reaching (so they say) no further than the outer rim of her domestic interests. The woman of to-day, whether employed in home-making or in the world of trade, buys her food almost or altogether ready to eat and her clothes ready to put on, and has time and energy left to study the politics of the world instead of new stitches in embroidery, to read literary papers at her club instead of poring over recipes, to engage in "settlement" and other charitable work, instead of devoting her whole time to the wants of her own household. She hires her shirt-waists embroidered, her sheets hemmed and her jellies made, and takes the time these labors would have consumed to read Dante and study economics and attend lectures on art.—From "Woman and Her Daily Life, Her Reading, Her Relations, Her Home Building, Her Housekeeping and Her Love," Clara E. Laughlin, "The Delineator" for March.

EXERCISE FOR ELDERLY PEOPLE.

"Health Culture" for February opens with a reproduction of a dialogue between Benjamin Franklin and the Gout, written in 1780. The reader will be surprised to note the great amount of what might be termed modern hygienic thought, that this contains. There is a practical paper on "The Treatment of Colds,"

and Dr. Latson, the editor, considers "Exercises for Elderly People" is of interest to all such as read it.

SUDANESE CLEANLINESS.

Throughout the journey, at nothing in my equipment did the natives gaze with such longing as at my supply of soap, writes William Gage Erving, in his interesting account of a trip by Adirondack canoe down the Nile, in the February "Century." It was unduly large when I left Berber; a week later it was gone. It was almost the only article which had the habit of strangely disappearing by day or night, and to make a present of a tiny piece was to make the recipient a warm friend. The Sudanese river-man is a cleanly animal; he bathes constantly in the river, and washes his clothing frequently, but the white cotton cloth gives little evidence thereof. The water he uses is thick with mud. The scrubbing-board is a rock, and the cleaning is accomplished by treading underfoot for an indefinite period the muddy heap of garments.

THE SEER.

Alone on his dim heights of song and dream
He saw the Dawn, and of its solace told.
We on his brow beheld the luminous gleam
And listened idly, for the night was cold.

Then clouds shut out the view, and he was gone,
And though the way is dubious, dark the night,
And though our dim eyes still await the Dawn,
We saw a face that once beheld the light!

—Arthur Stringer, in February "Century."

NO LIMITS TO RACE QUESTION.

We do not justify or excuse lynching. We do not believe in mob law, but it arouses our indignation when Northern men try to make it appear that the South is worse in this respect than the North. There are more race clashes in the South than in the North for the reason that there are more negroes in the South, but wherever there is a large collection of negroes in any Northern community there the race question exists and there the bad negro is summarily punished by the indignant whites whenever he goes on the rampage.—From the "Richmond Times" (Dem.).

AS THEY GO.

Two women sitting opposite the writer in an electric car pitched their voices so high that every word of their conversation could be heard by those sitting near them. Matrimony was evidently the subject of their conversation, for one of them said:

"Sometimes I think that if I was single I would not marry the Prince o' Wales hisself, an' then ag'in I dunno."

"Yes, that is so," replied her companion. "I feel just that way myself, an' I have as good a husband as the averidge, too."

"So have I—that is, as men run nowadays."—"Lippincott's Magazine."

NO CAUSE FOR WORRY.

There was a motherly looking old lady sitting in the midst of her bundles at the railway station, when a man with a handbag sat down beside her and began to read a newspaper. She eyed him pretty sharply for a few minutes and then inquired:

"Any great news in the papers to-day?"

"Nothing very extraordinary," he replied.

"See anythin' in there from Hicksville?"

"Not yet."

"I'm from Hicksville, or purty near thar'. Bin down here visitin' my sister. Haven't bin here but two weeks, but it seems a year. Only got one letter from Joseph, and about all he said in that was that he took his pen in hand to inform me that he was well, and hoped these few lines would find me the same—which they did. I'm a little worried. Don't find any item there about a house or barn burnin' up near Hicksville?"

"No, ma'am."

"Joseph was breakin' a colt when I came away. Don't see anythin' about a farmer gettin' his neck broke or bein' kicked to death?"

"Nothing of the sort, ma'am."

"Anythin' about any one falling down a well or off a haystack?"

"No, ma'am."

"Joseph is awful reckless, but mebbe he's got through all right. Anythin' about a mad dog bitin' anybody, or a gun bustin' and blowin' a man's head off while he was shootin' at a rabbit?"

"Nothing whatever. I think you will get home to find everything all right."

"I hope so, but two weeks is a long time to be away, and I'm naturally given to wofry more or less. I expect the pigs have got

out of the pen two or three times, an' I s'pose the colts have broken out again, and Joseph has left the cellar door open every night, but if it's no worse I shall be a thankful woman."—Chicago "Journal."

THEATRES AND BOOKS VERSUS SCHOOLMASTERS.

"There are a few theatres, and there might be more, in which fine action is finely displayed. Now one nobly conceived and nobly rendered play will give a stronger moral impression than the best schoolmaster conceivable, talking ethics for a year on end. One great and stirring book may give an impression, less powerful perhaps, but even more permanent. Practically, these things are as good as example—they are example. Surround your growing boy or girl with a generous supply of good books, and leave writer and growing soul to do their business together without any scholastic pawing of their intercourse."—H. G. Wells, in the February "Cosmopolitan."

NEWS FROM PROCTOR'S.

Broadway pedestrians who have for the past seven months wondered "what was up" in the lobby of Mr. Proctor's Fifth Avenue Theatre, have just had their curiosity gratified, for the new lobby is now open to the public day and night. It is a valuable and long-needed addition to the popular playhouse and it will be welcomed by the public as well. A reception room, with free use of the telephone; new retiring room for the ladies, and a spacious check room complete the interior alterations. The decorations are simple, but in good taste, and are in the Marie Antoinette style.

Mr. Proctor's seven beautiful playhouses, in and out of New York, make up the largest individual circuit in the world. In the spring the playgoer's fancy lightly turns to thoughts of comedy, and to gratify that annual desire Mr. Proctor has arranged for a brilliant series of revivals of most of the jolly farces in the repertory of his various stock organizations. Some of the cleverly witty pieces which will be presented are: "Why Smith Left Home," "The Wrong Mr. Wright," "What Happened to Jones," "Innocent as a Lamb" and "The Man from Mexico," all of them laugh producers from the first line to the final fall of the curtain.

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NECESSITY FOR REVACCINATION.—For the first quarter of a century subsequent to the introduction of vaccination, it was so generally protective from smallpox where practiced, that it was only at the latter end of that period that observers began to notice the necessity for its repetition. Many persons at that time, as at the present, were prejudiced against vaccination on account of the alleged communication of loathsome diseases by this means. Vaccination thus became the scapegoat of those who would cover their shame. Hence it fell into disrepute and neglect. But then, too, as now, smallpox was lurking in the wake of the unwary, and eventually fell upon the people as in days of yore. The city of Marseilles, in 1825, had a population of 40,000, only three-quarters of whom had been vaccinated. 2,000 had had the smallpox, and 8,000 had neither had smallpox nor been vaccinated. Of the 30,000 who had been vaccinated 2,000 contracted smallpox, 20 of whom, or one for every one hundred affected, died. Of the 2,000 who had previously had smallpox, either naturally or by inoculation, 20 contracted it again, and of these four died, or one for every five. Of the 8,000 who had not been vaccinated nor had smallpox, 4,000 contracted it, and 1,000, or one in every four, died. It thus appears that one-half of the non-vaccinated, one-fifteenth of the vaccinated, and one one-hundredth of those who had previously had smallpox took the disease. But such was the difference in the comparative mortality of the attack in the vaccinated and

those who had previously had smallpox, that while that portion of the population who had been vaccinated only lost one out of every 1,500, those who had smallpox the second time lost one out of every 500. Persons who have had smallpox in infancy are, at adult age, only 2 1-2 per cent. less liable to have it again than those who have been vaccinated in infancy—a proportion too small to be regarded as any evidence of real difference in protective power and reasonably attributable to spurious or impaired vaccination from a variety of causes, such as, etc.—A. N. Bell, i, 38.

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PREVENTABLE RESPIRATORY DISEASES.

By J. O. COBB, M.D.,
Surgeon U. S. Public Health and Marine Hospital Service.

In the United States there occurred in 1900 1,039,049 deaths in a population of 70,000,000. Viewed in the abstract the figures for the fatalities do not look so enormous, especially if we consider the tremendous gain in population for the last decade. And yet no sooner does one begin to look into the details of these fatalities than he comes face to face with the depressing fact that 44 per cent. are preventable, and due almost entirely to man's own carelessness, man's own dirt, man's ever disregard for the welfare of others.

If the Mississippi River were annually to overflow and kill this same percentage of people, viz.: 455,366, or 100,000 people, or even 10,000 people; or, to make it more presentable to the lay mind, if 455,366 head of cattle were killed every year by some epidemic disease, then such measures would be undertaken by an awakened public that a stop would be put to such extravagant waste of animal life, with its great loss of money. In the matter of the cattle there would be prompt action to suppress the disease, for here the disaster could be measured by dollars and cents, and it is truly a fact that one dead cow will draw the attention of any government of the world quicker than five dead men, ten dead women, fifteen dead children.

With perfect hygienic technique 44 per cent. of all fatalities could be prevented. This, of course, is not to be expected, but we could make a tremendous saving of life merely by careful attention to simple details of isolation and disinfection, which are easily carried out in children's diseases.

Passing by all the preventable diseases outside of our special subject, it will be necessary to take up the interesting figures connected with the group of diseases incubating on the respiratory

tract. The largest percentage of deaths were from those having demonstrable lesions in the lungs. There were 237,253 deaths, viz.: 111,059 were due to tuberculosis (10.68 per cent.); 105,971 were caused by pneumonia (10.19 per cent.); and 20,223 were reported under the name of bronchitis, though these fatalities should have been included in those for tuberculosis or pneumonia. These figures give us a total percentage of 22.81 of fatalities due to diseases with demonstrable lung lesions. Then taking up the most prominent of the diseases, which I claim must incubate in the respiratory tract, we find 16,645 were due to influenza, 16,475 to diphtheria, 12,866 to measles, 9,958 to whooping cough, 6,333 to scarlet fever, and least of all, 3,484 to smallpox, making all told 65,761. Quite a nice little army that would make!

One cannot for a moment comprehend this enormous and frightful havoc unless all the figures are taken in panoramic detail. Think of three hundred poor, cadaverous consumptives dying every day, twelve every hour! What a horrible grind! One here! One there! Your next door neighbor! In your own home! The disease steals in so insidiously, yet, withal, so constantly; and this tribute to Death has gone on so steadily from one age to another without abatement that we have learned to look upon these deaths with that stoic indifference born of hopelessness, the utter abandon of faith. And no less horrible is the contemplation of that other terrible disease of the overcrowded tenements, the stuffy basements, the loathsome sweatshops of great cities, from the same environment as tuberculosis, where annually a hundred thousand cases of pneumonia are sacrificed on the altar of commercialism. The two diseases go hand in hand in almost equal proportion, from the same homes, thousands upon thousands of them, strong men cut off from the world in the midst of useful manhood, and women in the cares of motherhood and home. And if we analyze the 65,761 cases included in the second class, we find that most of them are of children. These fatalities are the least excusable of all, and are a standing disgrace to the world. It is a lasting shame on the medical profession that these diseases are allowed to run riot as they do without a greater fight on our part, though I acknowledge a discouraging struggle.

No one will question that tuberculosis and pneumonia are infections that incubate in the lungs, and if the pathogenic organisms which cause them reach the lungs, then it is just as reasonable to believe that the specific organisms of other diseases also reach the

air vesicle and incubate there, the difference being merely that they grow without causing primary *demonstrable* lung lesions. Others of the contagious and infectious group may grow on the respiratory tract at any point, from the nasal mucous membrane to the air vesicle itself. That this is a correct statement seems reasonably certain, and it is the intention to point out and try to prove that the exanthemata, and several other diseases of obscure origin, are diseases of the respiratory tract in all instances, and in some their specific organisms grow only in the air vesicles or other portions of the lung.

Granting, then, that tuberculosis and pneumonia are true lung diseases, I shall attempt to prove that the primary colony of smallpox, measles, scarlet fever, whooping cough, typhus fever, cerebro-spinal meningitis, chickenpox, mumps, German measles, rheumatic fever, plague, influenza and diphtheria may be in the lungs only, while in some of them the colonization may be in the lungs, or bronchia, or on the nasal, pharyngeal or laryngeal mucous membranes.

INVISIBLE COLONIZATION.

It will be necessary before going further and into details, to mention some of the reasons for classing these diseases as respiratory diseases.

Of course, at the present time it is impossible to actually prove such an assertion, for the simple reason that so few of the specific organisms of these diseases have been isolated. In dealing with those which have not been worked out, we shall have to reason by analogy and the process of exclusion.

That the specific organisms of nearly all these diseases may incubate and grow on the respiratory mucous membrane without demonstrable macroscopic evidence, I believe to be an important fact. I furthermore believe that some of them, like smallpox, cerebro-spinal meningitis, measles, whooping cough and mumps, grow deep down in the lung tissue proper, on the air vesicle mucous membrane, and not elsewhere on the respiratory tract. If one will carefully examine every case that comes under his observation, he must be convinced that there is a time from exposure or implantation to the initial onset, when the organisms of all of these diseases have a fixed and nearly definite period in which they are, so far as we can demonstrate, quiescent. Even in pneumonia this is true. The germ is then not dormant surely all this time, for we have certain precursory and admonitory

symptoms with some of them, which leads one to believe that there has been a certain definite colonization, notwithstanding our inability to locate it by the aid of any of our senses. And if we carry our analogy into the laboratory it will not be so hard for one to believe this after becoming acquainted with so many bacteria that grow with nearly invisible colonies on artificial media, as, for example, the influenza bacillus and the diplococcus intracellularis. If they grow in nearly invisible colonies on artificial media, then why need there be any great stretch of the imagination to see in one's mind's eye the invisible colonization of these diseases on the respiratory mucous membrane?

Then, to repeat and emphasize the point, I believe it to be an important fact that most, if not all, of the specific organisms of the diseases named above may reach the lungs and go through their incubative period without causing demonstrable macroscopic lesions. This is certainly true of smallpox, chickenpox, whooping cough and measles. There must be a time from the introduction of the organism into the air sac, or onto the respiratory mucous membrane, when the germ is growing in a colony, or in several colonies, and yet in none of the prodromal stages of the exanthemata are we able to demonstrate a lesion, and often the patient does not complain of feeling bad until the completion of incubation is reached and the disease is ushered in with its characteristic symptoms. This is the original colonization, the virulence of which may become so powerful and the growth of the colonies so great, and the damage of the lymphatics so extensive, that the organisms are forced into the circulation, colonizing in other organs even to a greater extent than in the lungs. This is probably true of measles and scarlet fever, and especially noticeable in smallpox, with its extensive skin lesions. In the latter disease we have the strange phenomenon that while it exhibits itself in a fulminant skin lesion if contracted through the lungs, it has only a local significance if introduced through the skin, the invasion being very mild, if at all. The explanation of this peculiarity must be that the organism of specificity finds in the lungs the exact kind and exact amount of nutritive medium under the exact bio-thermal conditions which make it possible for it to grow, multiply and survive its incubative period in the animal organism. The various organs and tissues of our bodies contain bio-chemic constituents which materially influence the bacterial invasion as to whether there is, or is not, a colonization, or whether the infection is severe or mild, local or general. We

note this peculiarity of bacteria in the laboratory where an excess or often the least trace of some substance in the medium will inhibit or prevent colonization altogether, while the presence of this same material may be necessary in that exact formula for the growth of other bacteria. So it seems to be with this organism, that when introduced into the skin, or under the skin, it does not meet the necessary conditions to allow it to make a successful fulminant systematic invasion.

While the early clinical features of each of these diseases closely resemble one another, they nevertheless become widely different as the malady progresses. Furthermore, in the early or quiescent stage the products formed by the presence of living organisms in living tissue apparently have no effect that can be noted on the animal organism, while later in their course the severity of each will depend, in a large measure, upon the kind and the amount of this bio-chemic product.

In speaking of the infectious diseases, Wasdin has pointed out that:

"All of them have characteristics in common; primarily, they are infectious; then, they are characterized by clinical symptoms due to the influence of intoxicants, each of them exhibiting, however, some special reaction or symptom which serves to identify the disease; that is to say, they are all specific infections." . . . "Clinically these diseases resemble each other closely until the development of their specific symptoms, after which they are readily diagnosticated.

"Pathologically it is known that the chief disasters arise from the influence exercised by the toxins, formed by these organisms, upon the highly organized cells of the parenchyma of the organs of the body attacked, such as the fatty degeneration of the cells of the liver, kidneys and other organs, and the necrosis found at times in the same tissues." . . . and "The law, then, in these acute infections, which governs the formation of the types of cases encountered in all of them, is that the infection having taken place (presumably in most cases through or in the lungs) *the type of the disease must depend upon the development in the infecting organisms of the inherent qualities of toxicity and septicity; that if toxicity preponderates there will result the toxemiae, and if septicity be the more pronounced the septicemiae will be produced, since these qualities coexist in each infective germ, the one or the other being exhibited in greater perfection, according to environment.*" And here we must add the cultural peculiarity

that some bacteria, when introduced in favorable animal tissues, produce a very abundant exudate, while others may grow in a comparatively dry field, producing little exudate and yet be extremely virulent and fatal. Pneumonia is an example of the former, while scarlet fever is of the latter.

ANATOMICAL AND PHYSIOLOGICAL POINTS TO REMEMBER CONCERNING THE RESPIRATORY TRACT.

Just here, even if one is inclined to accept the contention that these diseases are all respiratory diseases, the physician is almost sure to question whether it be a physical possibility for dust or bacteria or other foreign matter to be breathed into the deep portions of the lungs,—to the air vesicles themselves. He would call to mind the cilia of the bronchial mucous membrane, and would remember the mechanical process of respiration, with its tidal air excursions back and forth, up and down the trachea and the bronchi many times before this air is passed along into the air vesicles. One thinks that surely in these many excursions that the foreign and ponderable matter of the inspired air would impinge somewhere on the ciliated epithelium and be genty wafted along on its outward journey imbedded in mucus. That is really true of nearly everything ponderable that enters the bronchia, but it is not wholly true, as I shall try to show.

It is necessary, here, to go into minuate details to clear up what is a common misapprehension of the modus operandi by which bacteria or other foreign matter of air reach the air sac.

The well-known fact that no amount of forcible inspiration would be able to drive bacteria or dust immediately and directly to the air sacs; and the further physiological phenomenon that the residual air column makes its mechanical exchanges by the transfusion of gases in the bronchia, and that the intake of tidal air in its various excursions up and down the trachea and bronchi. and, finally, the smaller bronchia, will nearly inevitably impinge the foreign body of a bacillus on the cilia and mucous membrane, makes one doubt if bacteria ever actually reach the air sacs and are deposited there. Unless we keep the histology of the bronchia and air sacs well in mind we are apt to form unwarrantable conclusions, for it is positive that coal dust cannot, and does not, penetrate the basement membrane of the bronchi or bronchioles, and yet we find that the deposits of pigment in the lung tissue correspond exactly with the lymphatic distribution, and to have reached the lymphatics and bronchial glands the dust must have

penetrated the walls of the air vesicles to the lymph radicles in the inter-cellular tissue. In miners and firemen, the deposits in the bronchial glands are so great that one can feel the gritty sensation in cutting through with the knife. That these deposits are particles of foreign matter taken up from the walls of the air sacs has been proved by many, and Rindfleisch was able to recognize the species of carbonized wood in charcoal workers.

"When particles of coal or pigment enter the bronchi with the air, they cannot pass through its mucous membrane, because the basement membrane and fibrous coat underlying it present an obstable to their lodgment, while the cilia of the epithelium tend to prevent their retention in the bronchi; they therefore enter the vesicles, and may be found sticking to the walls. In this way the exemption of the bronchi from pigmentation, even down to the smallest ramifications, can be explained. The interlobular septa are also the seat of great pigmentation. The germinating epithelium elevates the cells slightly above the surface, and in the interspaces between them the pigment insinuates itself, and thus enters the underlying plasmatic or lymphatic spaces; or the pigment may be incorporated into the epithelial cells, which transfer it to the underlying lymph space. Once the pigment has found entrance to the lymphatic channels, it is carried through the lymphatic vessels in the sheath surrounding the bronchial tubes and the small branches of the pulmonary artery,—and in the interlobular septa to the bronchial glands. In this manner the distribution of coloring matter in these situations is explained." (Bruen.)

"Between the air vesicles, frequently at the juncture of the angles of several, minute openings or stomata exist; they usually connect with microscopic passages leading into the lymphatic channels. By means of these channels particles of inhaled foreign matters, often deeply pigmented, are carried from the air sacs into the lymphatics, and become lodged within the interlobular connective tissues." (Piersol—Normal Histology.)

This question being reasonably settled, that foreign matter does reach the inter-cellular tissue through the walls of the air vesicles, it will be necessary to show the respiratory process which introduces this matter so deep into the lung, and against one's preconceived idea that such a thing is possible.

"The interchange between the fresh air in the upper portions of the respiratory apparatus and the air in the deeper parts of the lungs is constantly going on, in obedience to the well-known law of the diffusion of gases, aided by the active currents or impulses

produced by the alternate movements of the chest. When two gases, or mixtures of gases, of different densities are brought into contact with each other, they diffuse or mingle with great rapidity, until, if undisturbed, the whole mass has a uniform density and composition. This has been shown to take place between very light and very heavy gases, in opposition to the laws of gravity, and even when two reservoirs are connected by a small tube many feet in length, though then it proceeds quite slowly. In the respiratory apparatus, at the termination of respiration, the atmospheric air, composed of a mixture of oxygen and nitrogen, is introduced into the tubes with a considerable impetus and is brought into contact with the air in the lungs, which is much *heavier,* as it contains a considerable quantity of carbonic acid. Diffusion then takes place, aided by the elastic lungs, which are gradually forcing the gaseous contents out of the cells, until a certain portion of the air loaded with carbonic acid finds its way to the larger tubes, to be thrown off in expiration, its place being supplied by the fresh air.

"In obedience to the law established by Graham, that the diffusibility of gases is inversely proportionate to the square root of their densities, the penetration of atmospheric air, which is the lighter gas, to the deep portions of the lungs, would take place with greater rapidity than the ascent of the air charged with carbonic acid; so that 81 parts of carbonic acid should be replaced by 95 of oxygen. It is found, indeed, that the volume of carbonic acid gas exhaled is always less than the volume of oxygen absorbed. This diffusion is constantly going on, so that the air in the pulmonary vesicles, where the interchange of gases with the blood takes place, maintains a pretty uniform composition. The process of aeration of the blood, therefore, has none of that intermittent character which attends the muscular movements of respiration, which would undoubtedly occur if the entire gaseous contents of the lungs were changed with every respiratory act." (Flint.)

It will be seen, then, that in so far as forced respiration is concerned, it has little or no effect in driving air and the air contamination (dust) into the air vesicles direct, but if we look into the question more closely it will be observed that the different densities between the inspired air and the outgoing carbon dioxide causes transfusion to take place just as readily at the apex as at the base of the lungs, 95 parts of air replacing 81 of carbon dioxide, making the current, if there be a current at all, in toward

the vesicle, rather than outward, thus tending to draw foreign matter into the sac.

A common sight, familiar to all of us, is looking at a bright pencil of sunshine coming into a room, where we see the moving particles of dust constantly oscillating and changing position. Our patience never rewards us in seeing what is the final outcome of these particles, for they certainly remain and carry on their never-ceasing motion during the stay of the sunshine, and one could scarcely guess the revelations that the microscope might make of this field. We can imagine the millions upon millions of soluble foreign bodies, harmless bacteria, the non-pathogenic spores and rods of low plant life, that, in our dusty city life especially, are constantly inhaled; and being inhaled, myriads of the impalpable dust and carbon particles, spores with their rods and other bacteria enter the air vesicles and probably penetrate their walls, entering the blood current direct, or more often the lymph channels, to be wafted about, here, there, challenged at this post, arrested at that, being finally engulfed and swallowed up—digested probably by our efficient constabulary force, the phagocytes. After all, this is not so hard to believe of microscopic matter.

It is going to be hard to convince the majority of readers that this is a true picture or a reasonable conclusion. The average mind absolutely resents the idea that the blood can be tampered with in such a way; or that, if these foreign bodies do enter the circulation, they would look upon the passage of this matter through the capillary channels of our great organs, especially our brains, with great fear. However loath one is to believe such an astonishing thing, it is nevertheless true, as I shall try to show by illustration. All of us have seen the secondary infection of the lungs following surgical interference with gluteal or rectal tubercular abscesses or sinuses. To have reached the lungs the bacilli must have traversed some portion of the circulation, without arrest, until the lung is reached, where they are screened out. In acute abscess of the knee joint, following contusion, we find the pus-producing organism that could have reached the serous mucous membrane through no other channel than the blood. Any number of such explanations could be given. If one must have an incontrovertible demonstration of the fact, the experiment is a simple and a common one in laboratories. Take a fresh kidney or spleen from an animal under strict aseptic precautions, wrap in sterile gauze and keep it for two or three days. In the blood vessels of these organs we shall be able to demonstrate the or-

ganism of putrefaction, an anaerobic bacterium, which must have been present in some form during life, though it is impossible to demonstrate its presence until a certain time after death.

This simple experiment will surely convince one that the circulation of foreign matter or bacteria in the blood is not such a complex or startling phenomenon.

A common belief is that organs abundantly supplied with lymphatics and lymph glands withstand the onslaught of attack from infectious and contagious diseases with greater facility than those parts poorly supplied. We have been taught that the barring out process of nature was the principal work of the lymphatics. Especially have we believed this of the lymphatics of the upper respiratory tract. For certain diseases then it would seem that the lymphatics, together with the kind of epithelium attacked, would, in a measure, determine the severity of the infection and extent of colonization. Jacobi has called attention to this anatomical point when he says that:

"The elastic tissue, which is an important element in the formation of connective tissue, is least affected by chemical or organic influences. It is not present in the mucous membrane of the nose, but to a considerable amount in the buccal cavity, is very abundant in the walls of the lymph follicles of the tonsils, and predominates in the trachea. The influence of these anatomical conditions on the diphtheritic process must be very marked. It can easily be demonstrated that where the elastic tissue is prevailing, a resistance to diphtheritic impregnation is maintained for a long time, but when it has been forced to yield, there is a corresponding resistance to recovery.

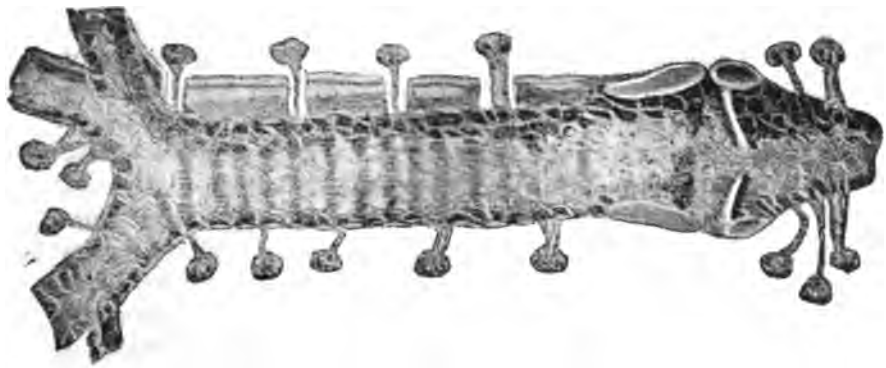
"It is pavement epithelium that gives the easiest foothold to diphtheritic membrane. Where it is most abundant the diphtheritic process can best settle and develop. That is why the tonsils, not from their prominent situation alone, but from the character of their surface also, are favorable to the reception and further development of an infection, and their elastic and connective fibres, when at last affected, are apt to harbor the process a long time. Ciliated epithelium, on the other hand, is not so liable to be invaded. It occupies a higher rank in the scale of animal formation, has a more complex function and a greater power of resistance; besides, it expels by its constant movements microscopic foreign bodies."

This point is further illustrated by a plate of Sappey's on the lymphatics of the larynx and trachea.

In explanation of this plate he says:

"LYMPHATICS OF THE LARYNX AND OF THE TRACHEA.—These vessels are remarkable by their number and their development. They are seen to be especially numerous at the level of the upper orifice of the larynx. They spread themselves with extreme abundance over the mucous membrane of the ary-epiglottic folds. They cover, also, all the surface of the epiglottis, and every other point of the laryngeal mucous membrane, forming, however, in this situation a network many times smaller; this mesh unites into two or three trunks on each side, which pass along the middle portion of the thyro-hyoid membrane, to empty themselves into the group of glands situated to the right and left of the larynx, under the sterno-mastoid muscle.

"The mesh, which is to be seen on the mucous membrane of the larynx, retains the same character in its course along the whole



length of the trachea and bronchi. (See cut.) The numerous small vessels which branch off from them at a right angle are almost lost in the glands which are placed on either side, ladder-wise, in relation to these canals."

" . . . and the lymphatics of the air passages, whether of the superior, middle, or inferior—in other words, of (1) the nasal fossæ; (2) the larynx; or (3) the trachea or bronchi—are more developed in the human species than in any other series of the mammalia; and this is especially true of the supply of the larynx. But there is a general tendency for the lymph system to diminish in the subglottic portions of the larynx, and in its course along the trachea. In the superior orifice of the larynx the vessels are multiplied to infinity, and when the injection is well made, a very rich and elegant network may be seen, which stretches from the median line toward the ary-epiglottic folds. This mesh ascends

also toward the free border of the epiglottis, which it covers completely. In some cases it descends over its anterior part, and is prolonged even to the base of the tongue. *Inferiorly,* it stretches over the corresponding wall of the vestibule of the larynx to the ventricular bands, becoming more and more attenuated.

"*Posteriorly,* the network spreads over the ary-epiglottic folds and all the posterior part of the entrance to the larynx, passing from the laryngeal to the pharyngeal mucous membrane. At this point the mucous membrane, which is thin and non-adherent, forms very numerous folds in its reduplications. Hence, the mesh acquires a richness and a tenuity which gives it an appearance without analogy in the economy. This excessive multiplicity of lymphatic radicles accounts for the gravity of lymphatic hypertrophies (angioleucites) in the superior half of the larynx, of which so little is still known.

"In passing from the superior to the inferior half of the laryngeal mucous membrane, the lymphatic system is seen to become abruptly impoverished, and this is more evident with advance of age."—(See Sappey's "Atlas," Plate XLII., Nos. 5, 6, 7 and 8.)

" . . . I long believed, and it seemed in effect rational to suppose, that these vessels were more developed in the adult than in the child, and that they were more so in the great divisions of the respiratory ramifications than in the secondary or third divisions. But this opinion was in flagrant opposition to all the results of observation. It is, on the contrary, in the first stages of life that the lymphatic system of the respiratory mucous membrane is seen to be most developed; and it is in the divisions and subdivisions of the windpipe that it attains its greatest importance. Hence, diseases of these parts are more frequent and severe during infancy. When one studies the disposition of the lymphatic vessels of the windpipe of an adult, one sees that they are almost wanting at the upper part; but inferiorly, one can inject them at certain points without much difficulty, and thus obtain partial networks of large mesh and of poor appearance, but nevertheless, very evident. Their branches empty into the peri-tracheal glands. Lower, at the bifurcation of the bronchi, the meshes are closer, and can be much better penetrated by the injected mercury. At the first bronchial divisions the injection becomes easy. We are thus enabled to recognize that, in the adult, the lymphatic vessels of the air-passages increase both in number and size as they approach the pulmonary lobules, in which they arrive at the perfection of their evolution.

" . . . In the newly-born infant, in the first year of life, and during the whole period of adolescence, the lymphatic network of the tongue, palate, tonsils, and commencement of the larnyx, is continued without attenuation or modification along the whole length of the respiratory passages, so that one can inject, without interruption, along the whole of the respiratory part, even to the minute divisions of the bronchi. The system is even more developed in the fœtus at term than in the adult. The contrast is, above all, remarkable in the trachea. . . . This striking difference between the development of the lymphatic system in the child and in the adult is a fact which has hitherto escaped the researches of anatomists, and is deserving not only of their attention, but, above all, that of pathologists. It at once suffices to account for the frequency of diphtheritic affections of the first years of life, and for their rarity with advance of age; it explains also the extreme gravity of these affections." (Quoted from Browne.)

Clinically, then, the removal of enlarged tonsils and adenoid growths is certainly a correct and wise surgical procedure.

If we examine into the anatomical distribution of the lymphatics of the nasal, pharyngeal, laryngeal and bronchial mucous membranes, we shall note that a bacterium or other foreign body, to reach the circulation through these, would have to run the gauntlet of a numerous outpost of glands established by nature in this locality for the very purpose of arresting foreign matter. We know that foreign matter, such as coal dust, does reach these glands, for the pigment in them is demonstrable, and still there is, comparatively speaking, very little coal dust that reaches the circulation or the glands themselves, through the lymphatics of the upper respiratory tract. It is but reasonable to believe that micro-organisms, arrested in lymphatic glands, have less chance of reaching the circulation than if they grew in one of our great organs. Lymphatic glands are especially adapted for the destruction of bacteria, and probably do so, to a very large extent, in all diseases except syphilis and the carcinoma. If bacteria, tubercle bacilli especially, enter our bodies through the tonsils, as so many writers would have us believe, I would point out and controvert their position by calling attention to the infrequency of infection of the deep cervical glands, through which these organisms would have to travel; and to the further observation pointed out elsewhere that if bacilli do enter the circulation in this manner, it is, nevertheless, the bronchial glands that show

the constant arrest of the organisms. Notwithstanding Lartigau's recent report of finding tubercle bacilli in a large percentage of tonsils and adenoid tissue, it is only fair to presume that there certainly could be little difference in the functions of the cervical and bronchial glands, and there is no more valid reason to suspect that bacilli will pass the cervical ganglia without harm, than that they will pass the bronchials without arrest. We see in scarlatina and diphtheria, with their throat colonies, that the cervical glands become infected and partially arrest the invasion of the contagium through these channels. It is very likely, then, that the resistance of the deep cervical glands is very effective in barring the entrance of bacteria to the circulation, while if the colonization be in the lungs it would seem that organisms could enter the circulation direct with greater facility than elsewhere. The peculiar structure of the pulmonary tissue is such that in the very nature of things it would be the lungs, rather than any other organ, that would screen out and arrest foreign matter.

There is one other anatomical point worthy of mention, and that is the theory that infection in cerebro-spinal meningitis and tubercular meningitis is caused by the organisms of those diseases gaining entrance to the meninges through the anastomosing of the intra-cranial lymphatics with those of the nose. It is very true that the dura sends processes down through the cribriform openings, and that the capillaries draining these processes empty into the lymphatics of the dura. It is extremely doubtful if there is any possibility for an infection to thus reach the meninges. The chance of infection by this route surely can only be inconsequential.

THE SPREAD OF DISEASES THROUGH THE MEDIUM OF INFECTED DUST.

Having shown that coal dust and other foreign matter may penetrate to the very bottom of the lungs, to the most remote air vesicles, it will be necessary, for the next step, to inquire into the details by which one person communicates disease to another through the medium of infected dust.

Now, if the diseases under discussion are not communicated from one person to another by means of infected dust or infected atmosphere, it is but reasonable that we ask of one who may disagree: What is the mysterious medium of conveyance? If not through the respiratory tract it can only be through the skin, or by ingestion through the alimentary mucous membranes. Of course, we have diseases that are introduced sometimes in one man-

ner and sometimes in another. Plague, anthrax, yellow fever, relapsing fever, diphtheria, dengue, glanders, typhoid fever, etc., are peculiar in this respect, that one may be inoculable or inhalable, or, in a few instances, introduced by ingesta. But, while this is true of a few, our clinical experience is sufficient to convince a reasonable person that smallpox, measles, mumps, scarlet fever, etc., are purely inhalable diseases that incubate only on the respiratory tract, probably, in most instances, in the air vesicle itself. That the pathogenic catastrophe may demonstrate itself in some remote organ far from the lung cannot be fair argument against the theory, for we have too many positive clinical facts to show that the idea is correct. If plague be introduced through the skin, the initial lesion may never be in evidence at all, while the greatest lesions will be in the lungs and glandular system. In the case of glanders, Billings has pointed out that, however introduced, the lungs were sure to become badly involved. In mumps one is sure to question this contention, and rather seek the explanation that the infection has reached the glands through the duct. Yet under the discussion of mumps it will be shown that a fair percentage of cases have occurred where the original demonstrable colonization has been in the testicles, without any manifestation of the disease ever having been in the parotid gland at all. And even in typhoid fever, Wasdin has gone so far as to declare that the original colonization may be in the lung, and the secondary colonization quite often so. We are all too ready to doubt that bacteria can, or do, enter the circulation, traverse our various organs, and colonize in distant and remote parts. There can be no good reason for this doubt when we see almost daily the effusion in joints of gonorrheal patients, which we are fairly certain has been caused by the immediate presence of the gonococcus. This organism, to have reached the serous membranes of the joints, must have penetrated to the capillaries from the urethral mucous membranes and made the circulatory excursion, via the lungs, before being washed out on a favorable medium. Many investigators have demonstrated that the pneumococcus may enter the circulation from a colony in the lung, and that it occasionally grows in other fields, the most frequent being the meninges. Sternberg calls attention to the fact that this organism, when introduced subcutaneously, will not cause pneumonia, but seeks the serous membranes. And if the pneumococcus enters the circulation from the lungs, as we are sure it does, it is certainly in the bounds of reason to believe that the micrococcus intra-cellularis (granting,

of course, that Wiechselbaum's contention is correct, that this is the organism of specificity in epidemic cerebro-spinal meningitis), reaches the brain from and through the lungs. And while speaking of this organism it may be well to revert to the original statement that it surely must grow in the lungs without visible colonies and without demonstrable exudate, while the pneumococcus, an almost similar organism morphologically, grows in the lungs with an enormous amount of exudate, and produces very little when growing on the meninges or other serous membranes.

Not going further into this phase of the question it does seem to be a reasonable and believable statement to make, that all of the diseases under discussion are caused by the individual and specific organism of each being planted on the respiratory tract, either by the means of still floating droplets of saliva, or mucus or infected dust, the dust having become infected from mucus ejected from the tract. The infection is also possible from infected exfoliated epithelium. In either, or in all events, the first colonization of any of these diseases, with the possible exception of plague, can be nowhere else than on the respiratory tract. An infectious or contagious disease must be introduced either through the skin (inoculable), through the lungs (inhalable), or by the alimentary canal (by ingesta.) Some of them may be introduced by one only, or in all of the methods named.

WHAT HAPPENS WHEN A WELL PERSON COMES IN CONTACT WITH A PATIENT SICK WITH A CONTAGIOUS OR INFECTIOUS DISEASE.

That merely coming in contact with the sick person will give one the disease is a foolish belief among the laity, and it is now well established that one sick of these diseases cannot communicate his illness except by first infecting his surroundings, his bed, his carpet, his floor, the atmosphere of his room, with either the dried exhalations from his respiratory tract, which contain the contagium, infected droplets, or from the dried scales of exfoliated epithelium given off from his body. To make my claim perfectly plain, it is contended that none of these diseases can be contracted by mere contact until the immediate atmosphere is infected, and that this infective atmosphere must be breathed to introduce or plant the organism on some portion of the respiratory mucous membrane. Therefore, meeting a person with smallpox in the street would be attended with very little danger in comparison with entering the room of this same patient several hours after he had been confined there, or riding in a closed street car after a

case had traveled in it for some distance. Ask the average man of intelligence how he thinks that the disease is contracted, and he will not know. Nearly every one has a notion that merely coming in contact with the sick has some mysterious influence to convey the contagium—to drive it in, so to speak. If one has been exposed to smallpox or scarlet fever his friends will flee from him and not let him come near, and yet there are very few unmistakable instances where a physician has been known to carry the disease from one person to another without first having contracted the disease himself, thereby becoming a medium. That the laity should have so little knowledge concerning the method of spread is what one would expect, though it should be otherwise, but medical men themselves cannot be excused altogether, though very few medical books go carefully into the subject, and most of them fail to mention the matter at all. Ask the average physician pointedly, How does one person contract smallpox from another? and immediately he is wofully at sea. He is lost, for no sooner does he give a halting reply that it is probably through the lungs, than he is confused worse than ever by being asked then, Where does the organism incubate, where does it grow, in what organ or organs does it finally permanently colonize?

I believe that if we could so protect our breathing apparatus that no contamination or dust could enter the respiratory tract, that that would be the end of tuberculosis, of pneumonia, of smallpox, of measles, and the others named before. If the room and immediate surroundings of every case were properly disinfected and the patient isolated for a sufficient time to be absolutely certain that the organism was not still viable and virulent on his respiratory mucous membranes, then we would, as in the condition of pure air, completely wipe out these diseases. The first proposition of uncontaminated air is, of course, absolutely impossible. That the second proposition, of thorough disinfection, can be successfully carried out is a scientific fact and only a sanitary problem. It is an obligation on the public to stop this frightful annual slaughter; and if such wholesale negligence cannot be comprehended in dollars and cents, the expediency of the question alone must appeal to every thinking mind. Name the household that has not had the visitation of one of these children's diseases, taking off some member of the family. Look at the spectre of sixty-five thousand little souls being annually fed to the god Moloch,—little ones dead from preventable childhood diseases,—preventable ignorance diseases,—preventable filth diseases. Take

the man of means who is sometimes entirely indifferent to such matters; stop the busy specialist on children's diseases for just a moment; call the mother in from her work among her seven or eight children, all of whom she is proud to say have had some one of these diseases; and detain the visiting priest or minister who aids in the dissemination of the superstition that these are necessary visitations from on high; detain all of these just long enough to point out to them that with every hour ticked off by the clock there dies of the exanthemata in the United States, seven children; one hundred and seventy-eight each and every day; twelve hundred every week; five thousand every month. Think of it, that with the passing of every hour, seven children drift out into eternity, sacrifices pure and simple to the ignorant idea that these preventable diseases are necessary childhood diseases. Seven dead children, seven weeping mothers in seven grief-stricken homes! It is not necessary: it should not be. This, too, in our own country, with its abundant and varied food supplies, with its comparatively sparsely settled country and with the delights of self-government. It is bad enough here, but what the conditions may be in some of the thickly settled sections of Europe is terrible to think about.

HOW, THEN, DO THE SICK INFECT THEIR SURROUNDINGS?

Von Leyden and other experimenters have shown that, with consumptives, droplets of infected sputa were sprayed out from coughing, a distance of fifteen feet. Not a few experimenters have made careful examinations of the air exhaled in the process of passive breathing, but so far these observations have been unsatisfactory. A few have tried to demonstrate the influenza bacillus in this manner, but were unsuccessful. However, even though this experiment has proven negative, no one cares to breathe the exhaled contaminated breath of the sick, and no surgeon would be willing for one to breathe on an open wound. I do not, for a moment, believe that the contagium is volatile, or that the passive expired air passing over a moist colony would pick up bacteria, but one must believe that in forcible breathing, in coughing or sneezing that hundreds of droplets and tiny air bubbles are driven off into the surrounding atmosphere. In any event, we know that nearly all, if not the whole, danger is from the droplets of infected mucus which are driven off by the explosive cough, bronchitis being one of the earliest symptoms of any of these diseases.

Cases are reported where a person meeting another on the street or in the road has contracted smallpox. In another instance I heard of a child that went to a school entertainment and who had not then broken out with measles, and yet it is claimed that she gave the disease to a great number of children present. That such cases are possible, I admit, but that they are extremely rare there is no doubt.

It appears necessary for the contagium to be confined to become infective; and it seems, too, that it takes a definite number of days for it to infect a room. Probably, however, this depends much upon the amount of moisture in the room.

In smallpox, chickenpox and scarlet fever it is reasonable to believe that the exfoliated epithelium may contain the specific organism and be infectious if inhaled. A crust from a smallpox pustule will certainly furnish a vaccine to another person, and, of course, it is possible, and probable, that the disease may be spread by exfoliated epithelium. We have many apparently well authenticated histories of cases from fomites, but they are probably less frequent than supposed, and I think that most of them originate from breathing infected dust in infected houses.

I cannot believe at all that the sweat from these cases contains the organism, or that it can become infective in any way.

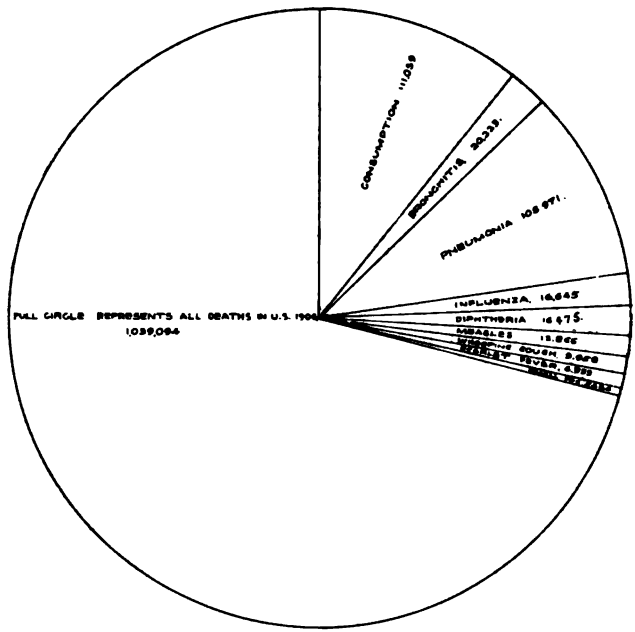
Then, if we grant that the infection is introduced onto the respiratory tract by infected dust, whether that dust be from dried saliva, dried sputum or dried epithelium, the course of procedure in preventing further spread of the disease is usually simple and plain, and, in any event, a bounden duty on the part of every one of us to study these cases, and try to prevent their spread by personal supervision and teaching the laity the many simple details of preventive medicine.

INTERESTING STATISTICS.

About 30 per cent. of the mortality of the world is due to diseases caused from infected dust. Approximately 6½ per cent. of all mortality is in early childhood from dust diseases—lung diseases—preventable diseases. The most serious problem before the epidemiologist to-day is the one of lowering the mortality of early childhood and checking the spread of pneumonia and tuberculosis. In the matter of children's diseases belonging to this group, the mortality can be lowered to a very small figure, because they are so easily controlled if once health boards become aroused and the public educated to the insidious dangers from them. A glance

at the schematic cut below will convince one that such diseases as measles and whooping cough are looked upon with too much indifference, and the very large mortality list is sure to excite astonishment.

It will be noted that of the diseases shown in the cut, smallpox is now of the very least importance, while whooping cough kills three times as many as smallpox. These are not exceptional figures at all, and they run fairly uniformly throughout the decade in that proportion, with the exception, of course, of influenza, which fluctuates markedly from year to year, and the influence



of influenza also causes a difference in the pneumonia figures, there being an increase in the pandemic years of influenza. The figures are further interesting from another viewpoint, viz.: that with the exception of pneumonia (and omitting the pandemic and epidemic figures for influenza) all of the diseases of this class are decreasing in mortality, the most surprising decrease being in tuberculosis and diphtheria.

The census figures covering this point are inserted here entire as they are extremely interesting, not only concerning the diseases under discussion, but also in showing that in the other preventable diseases of childhood the crusade of intelligence is becoming ef-

fective. This is most marked in cholera infantum—that disease of criminal ignorance.

Death rates due to certain diseases, per 100,000 *of population, in the registration area in* 1900 *and* 1890, *and the increases or decreases in the rates.*

Causes.	*Death Rate.* 1900.	1890.	*In-cr'se.*	*De-cr'se.*
Consumption	190.5	245.4	....	54.9
Debility and atrophy	45.5	88.6	....	43.1
Diphtheria	35.4	70.1	....	34.7
Cholera infantum	47.8	79.9	....	31.9
Bronchitis	48.3	74.4	....	26.1
Convulsions	33.1	56.3	....	23.2
Diarrheal diseases	85.1	104.1	....	19.0
Croup	9.8	27.6	....	17.8
Typhoid fever	33.8	46.3	....	12.5
Diseases of the brain	18.6	30.9	....	12.3
Malarial fever	8.8	19.2	....	10.4
Unknown causes	16.8	24.6	....	7.8
Inflammation of the brain and meningitis	41.8	49.1	....	7.3
Hydrocephalus	11.0	15.4	....	4.4
Dropsy	6.9	10.3	....	3.4
Whooping cough	12.7	15.8	....	3.1
Paralysis	32.8	35.5	....	2.7
Scarlet fever	11.5	13.6	....	2.1
Septicemia	10.0	7.7	2.3	....
Diabetes	9.4	5.5	3.9	....
Pneumonia	191.9	186.9	5.0	....
Premature birth	33.7	25.2	8.5	....
Old age	54.0	44.9	9.1	....
Cancer	60.0	47.9	12.1	....
Heart disease	134.0	121.8	12.2	....
Apoplexy	66.6	49.0	17.6	....
Influenza	23.9	6.2	17.7	....
Diseases of the kidneys	83.7	59.7	24.0	....

It will be noticed that pneumonia is slowly but surely on the increase, be the figures from the south or the west or the east, or from the blizzard-swept plains of Minnesota, the pine-covered districts of Maine, or the overcrowded negro quarters of the populous communities of the South, the greatest increase being in the South-

ern States, and those States possessing large cities with overcrowded tenement districts. This disease is purely a communicable disease from infected dust, and is peculiar to overcrowded communities. This phase of the question will be dealt with more fully under the head of pneumonia.

That sanitarians, teachers in the public schools, and the public in general, are awakening to the study of preventive measures, is evidenced very forcibly by the gratifying fact that the average age at death in the registration cities has been lengthened from 31.1 years, in 1890, to 35.0 in 1900, an average gain of fours years of life in a decade. This is truly remarkable; and this wonderful result has been brought about almost entirely by educating the masses in cleanliness in certain directions, aimed principally to prevent alimentary diseases of childhood, tuberculosis and the exanthemata. In cholera infantum alone the decrease has been wonderful (31.9), while consumption (54.9) and diphtheria (34.7) make an enormous gain. In the latter the gain is not alone in lessened mortality, but a decrease in the number of cases, showing that antitoxin has not only reduced the actual mortality of those attacked, but has seemed to reduce the number of cases as well.

In this connection, to bring the question down to the practical, it will be necessary to take up these diseases concisely and emphasize the clinical points of each that has special bearing on our subject.

(*To be continued.*)

FOOTBALL AND INSANITY.

During the year 1902, two men in America were killed in prize fights; and, in a season of three months just passed, twenty-one men have been killed playing football. Fifteen of these have died from broken necks or broken backs. How many men have been ruptured and permanently injured in various other ways no man can say. "I know," says Elbert Hubbard, in the March "Cosmopolitan," "that two young men, with whom I am personally acquainted, are now in lunatic asylums as a result of football, and their ravings are the cries and signals of this game. If you still think that football is manly sport, you might interview the parents of these young men."

TUBERCULOSIS: ITS CAUSATION AND PREVENTION.

By HERMANN M. BIGGS, M.D.,

Medical Officer and Director of the Bacteriological Laboratories, Department of Health, New York City; Professor of Clinical Medicine University and Bellevue Medical College.

No subject more vitally concerns the welfare of a community than that pertaining to its healthfulness. How its members live, and how and at what age they die, how much sickness occurs among them and what is its nature, are questions of vital importance, both to the community as a whole and to each individual in it. These are essential features of the problem, whose gradual solution will teach men more and more how to live properly, and how they may secure longer, healthier, and therefore happier lives.

The healthfulness of any community or locality is to be judged by the statistics of sickness and death, considered in relation to the causes of such sickness and death (it is not only the number of deaths or the number of cases of sickness in proportion to the population, but also the nature of the diseases which cause this). In rural districts the degree of healthfulness depends largely on the natural conditions, such as elevation, climate, soil, and to a less extent upon artificial conditions. In densely populated cities, on the contrary, the natural conditions become relatively unimportant factors in determining the degree of healthfulness, so much do they become subordinated to the artificial conditions resulting from the lives and labor of the inhabitants. It may be said, within certain limitations, that the inhabitants of every city have it largely within their power to determine what the death rate of their city shall be. The presence of much sickness and of a high death rate in any urban population are largely due to the existence of unsanitary conditions in the occupations, habitations, food and water supply of the inhabitants—all factors which lie to a great extent within their control. Hence, when any city has a high death rate —for example, when thirty or thirty-five persons out of every thousand of the population die each year, as was formerly the case in Liverpool and New York, instead of fifteen or twenty, as

is the case in many of the larger cities to-day—it is because unsanitary conditions are permitted to exist. These exist to a very small extent, from necessity, but chiefly because of ignorance, neglect and indifference on the part of the people, or incompetence on the part of the authorities.

The average length of life in any country or city is spoken of as the "expectation of life at birth." This average life term in some cities—for instance in Liverpool and Manchester, which have been distinguished for their high death rates—is often but little more than one-half that of the healthiest country district. The average lifetime of each person born in Liverpool, until recently, was twenty-six years; in London it was thirty-seven years; while in Surrey, a healthy district, it was forty-six years.

These considerations show how vast is the significance to every individual of the degree of healthfulness of the community, for upon it depends not only his or her relative freedom from illness, but also his or her probable lifetime.

In the casual consideration of the healthfulness of communities as compared with the conditions existing in earlier centuries, we are inclined to think, without investigation, that there has been but little advance in modern times, and that while some diseases have been greatly restricted, or entirely stamped out, these have been replaced by others equally as fatal to the human race. More careful study, however, shows how erroneous are these views. In the seventeenth and eighteenth centuries, the average annual death rate per 1,000 of the population throughout the civilized world was at least 50, and probably much more. From 1620 to 1643, the absolute annual mortality for London was over 70 per 1,000 of the population, and the average duration of life of each person born, less than fifteen years. One hundred and fifty years later, for the decennial period ending in 1780, the expectation of life (or the average lifetime) in London had increased only four years, and was nineteen years; while from 1831 to 1835, including an epidemic year, the death rate had fallen to 32 per 1,000, and the mean expectation of life had increased from nineteen years to nearly thirty years. At the present time the mean life term for all England is considerably more than forty years, or more than double that of 1780. From 1770 to 1780, in London, not less than 5 in 1,000 died annually of smallpox; the death rate from this disease is now an insignificant fraction. In the sixteenth century, fever, plague, cholera and dysentery—diseases which are now practically extinct in civilized communities—destroyed annually

nearly 31 out of every 1,000 of the inhabitants of London, or nearly twice the total deaths now from all causes. Even previous to 1875, 518 out of every 1,000 children born in Liverpool died during the first ten years of life, while in the healthy districts of England only 205 died during this period. Formerly in New York City more than 600 out of every 1,000 children died during the first ten years of life; this mortality has now been reduced one-half.

I have referred to these general facts in regard to the significance of death rates, and to certain features in the sanitary history of the past, simply to emphasize the importance to the individual of the sanitary conditions of the locality in which he lives, and to bring out more clearly the enormous advances that have taken place in the last fifty years in general sanitary conditions. A large number of those diseases, which in the past frequently decimated the population, have been either restricted within narrow limits, or completely stamped out. Plague, typhus fever, epidemic dysentery, Asiatic cholera, leprosy and smallpox, are among the diseases which either have been completely stamped out in civilized communities, or occur only spasmodically or in small epidemics; their influence in the production of sickness and death has fallen to insignificant proportions. The prevalence of typhoid fever in most well-regulated communities has very greatly decreased. Through the introduction of diphtheria antitoxin, the mortality from diphtheria has been reduced to one-half, one-third, or to even one-fourth in some localities, of what it formerly was. Through the remarkable observations made in Cuba by Ross, of the United States Army, and his associates, the prevalence of yellow fever is likely to be restricted, in the future, within narrow limits, as has been previously the case with each of the other great epidemic diseases.

I might mention several other infectious diseases whose prevalence has been restricted within very much narrower lines through the developments in modern preventive medicine, and among these is tuberculosis; and still there is no problem which confronts the sanitary authorities of the large municipalities at the present time equal in its importance and magnitude, than that presented by the tuberculous diseases, nor is there any other sanitary proposal which offers the promise of such vast returns in a diminishing rate of sickness and death, as one which provides successful measures for the prevention of this disease. This, although not a new problem, is of supreme importance. The tuberculous diseases are

not more prevalent than formerly; on the contrary, there has been a steady and material decline in the death rate caused by them in most of the large cities of the world; but only in recent years have the sanitary authorities and the medical profession begun to have some realization of the great possibilities in the restriction of this disease.

A comprehension of the full significance of the discoveries of Robert Koch, made twenty years ago, on the prevention of tuberculosis, has only slowly found its way into the minds of the medical profession, and even now a large proportion of the profession and of the laity have failed to grasp its vast influence on the present and future happiness and prosperity of the human race.

Koch showed in 1882 that tuberculosis was an infectious and communicable disease, produced by a germ, the tubercle bacillus. It followed, as a necessary result from his discoveries, that it was an absolutely preventable disease. So slowly, however, did the significance of these discoveries penetrate the minds of the profession and the people that already twenty years have passed, and we have only just now begun to organize inadequate measures for the prevention of this disease.

Statistics, showing the great prevalence of the tubercular diseases, have been quoted so frequently as to have almost lost their force, and still the people, the legislators, the sanitary authorities, and even the medical profession, have remained indifferent to the vast expenditure unnecessarily made by the human race to this evil. Only limited, ineffectual efforts are made in its suppression, and we still view with comparative indifference the ravages of a disease which causes from one-quarter to one-third of all the suffering and death at the best period of life—between the ages of fifteen and fifty-five; and this, too, when the evidence at command should be, it seems to me, conclusive to every reasonable mind that this loss could be largely prevented at a comparatively small cost in sacrifice, labor and money. I make this statement with a full realization of its meaning, and after a familiarity with the sanitary problems involved gained by an active participation in their study in a great city for a period of nearly fifteen years.

It may be useful to discuss, in as simple a manner as possible, certain questions which are suggested in regard to tuberculosis. First: What is tuberculosis? The disease known as tuberculosis, and when affecting the lungs, as pulmonary tuberculosis or consumption, is an infectious and communicable disease. It is very

common in human beings and in certain of the domestic animals, especially cattle. About one-fourth of all deaths occurring in human beings during adult life in all civilized countries is caused by it, and nearly one-half of the entire adult population at some time in life acquire it. It has been proven beyond any possibility of doubt, that a living germ, called the tubercle bacillus, is the cause, and the only cause, of tuberculosis. It does not seem necessary to state the facts upon which this assertion is based, for the discovery, first made by Robert Koch in 1882, has been confirmed so often and so completely, that it now constitutes one of the most absolutely demonstrated facts in medicine. Tuberculosis may affect any organ of the body, but most frequently first involves the lungs, and is then commonly known as consumption. When it affects the skin it is known as lupus; the lymph glands are frequently diseased, and especially those in the neck, and this type was formerly known as scrofula. The commoner forms of chronic disease of the knee joint, hip joint, and spine are generally the result of tubercular infection of the joints and bones. The disease may also affect the throat, the intestinal canal, the coverings of the brain, or any of the other organs and tissues of the body. It is always the same disease when found in any one of these parts, and always produced by the same germ—the tubercle bacillus. When these germs find their way into the body they multiply there, if favorable conditions for their growth exist, and produce small new growths or nodules, which are called tubercles, and from these the disease tuberculosis derives its name. As the result of the action of the germs contained in the tubercles they tend to soften, and the discharge from these softened tubercles containing the living germs—tubercle bacilli—are thrown off from the body. In pulmonary tuberculosis, or consumption, these germs are contained in the expectoration, often in most incredible numbers. It has been estimated that in some cases two or three thousand million tubercle bacilli are discharged in the expectoration from a single case of consumption in the course of twenty-four hours. The germs thus thrown off do not grow under ordinary conditions outside the living human or animal body, although they may frequently retain their vitality and virulence for long periods of time, even when thoroughly dried. As tuberculosis only results from the action of these germs, it follows, from what has just been said, that when the disease is acquired it must result from receiving into the body the living germs which have come from some other living being affected with the disease.

It should be especially noted, in this connection, that tuberculosis differs widely in this respect from some other infectious and communicable diseases, like typhoid fever, in which the germs multiply outside the living body after having been thrown off in the discharges of some persons suffering from the disease. The tubercle bacilli do not find the conditions necessary for their multiplication, except in living beings, human or animal, and therefore, when tuberculosis occurs, it must be as the result of infection directly by the same identical tubercle bacilli, which have been thrown off from some human being, or possibly from some animal, suffering from the disease.

Tuberculosis is commonly produced in the lungs, which are the organs most frequently affected first, by breathing air in which living germs are suspended, as dust. The material which is discharged, sometimes in large quantities, by persons suffering from consumption, as has been said, contains the germs often in enormous numbers. This material, when expectorated, frequently lodges in places where it afterward dries, as on the street, floors, carpets, clothing, handkerchiefs. After drying it is very apt, in one way or another, to become pulverized, and then floats in the air as dust. It should be especially noted that it is chiefly a source of danger after drying, and not when in a moist condition. It has been shown, experimentally, that dust collected from the most varied points—in hospital wards, dispensaries, asylums, prisons, rooms in private houses, and even street cars, where consumptive patients are present, or have been present—is capable of producing tuberculosis in animals when used for their inoculation. Such dust may retain for weeks its power of producing the disease. On the other hand, dust collected from rooms in institutions or houses which have not been occupied by tubercular patients does not produce the disease when used for the inoculation of animals. These observations show conclusively that where there are cases of pulmonary tuberculosis, under ordinary conditions, the dust surrounding them is likely to contain the tubercle bacilli, and persons inhaling the air in which this dust is suspended may be taking in the living germs. It should, however, be distinctly understood that the breath of tuberculous patients and the moist sputum received in proper cups are not elements of danger, but only the dried and pulverized sputum. The breath and moist sputum are free from danger, because the germs are not dislodged from moist surfaces by currents of air. Handkerchiefs and clothing, which have been soiled by sputum, are par-

ticularly dangerous, because on these the sputum dries, scales off, and then becomes pulverized. If all discharges of tuberculous persons were destroyed at the time of exit from the body, practically the only danger of communication of this disease from man to man would be removed. It follows, then, as an absolutely necessary sequence of what has been said, that tuberculosis is not only a distinctly preventable disease, but is much more readily and certainly preventable than most of those diseases usually called contagious, for the sole source of infection is contained in the discharges, which may be readily destroyed at the time of exit from the body.

It may, perhaps, be well here to define a little more fully what is meant by an infectious and communicable disease, such as tuberculosis is, and how it differs from one which is contagious. Any disease which is produced by the entrance and multiplication in the body of some minute form of animal or vegetable life of simplest structure is called an infectious disease. The contagious diseases, examples of which are smallpox, scarlet fever, measles, etc., form one class of the infectious diseases. They have several distinguishing characteristics:

(1) In none of these contagious diseases have we any knowledge as to the exact nature of the specific organism causing them. This is a rather remarkable fact, and seems to indicate that they are caused by some kind of life which our present methods of investigation will not reveal.

(2) These diseases may be transmitted to well persons through simple proximity to the sick for a short period of time; smallpox, for example, may be contracted by passing in the street a person suffering with the disease. A person sick with one of the contagious diseases may so infect the atmosphere of the room in which he is present that any susceptible person entering it may contract the disease.

(3) In the contagious diseases there are no adequate precautions known which will render a person suffering from one of these diseases free of danger to those coming in immediate contact with him.

The class of infectious diseases to which tuberculosis belongs I have called communicable and non-contagious. In this class belong typhoid fever, diphtheria, Asiatic cholera, pneumonia, tuberculosis, etc. In each of these diseases the cause is well known, and its life history has been thoroughly studied. We

know how the germs enter the body, what they do in the body, how they are thrown out of the body, and how they act outside of the body. They are always contained in some discharges from the body; viz.: in typhoid fever in the discharges from the bowels and kidneys; in cholera, in the discharges from the intestines or stomach; in tuberculosis, in discharges from the diseased tissues, wherever they may be. If these discharges are destroyed at the time of their exit from the body, all danger of communication of the disease to others is removed. The room occupied by a person ill from one of these diseases, and the atmosphere of it, are not, under proper conditions, in any way a source of danger. The most intimate contact with a tuberculous patient may, under proper conditions, be quite free of danger. It has been frequently said that a properly conducted sanatorium for consumptives is the safest place one can find, so far as the liability of contracting this disease is concerned.

I have always felt that much harm has been done by calling tuberculosis a contagious disease. It causes confusion in the lay mind, because the popular conception of a contagious disease is connected with such diseases as scarlet fever and smallpox, in which a very limited contact may result in infection. Every person should understand that tuberculosis is quite different in nature from these diseases, and the mental confusion caused by calling it contagious often results in producing incredulity, or a totally unwarranted fear of contact with tuberculous persons. Too much emphasis cannot be placed on the fact that consumptives are only a source of danger through the discharges from the diseased tissue—chiefly the sputum—and if these are destroyed the most intimate contact with tuberculous patients is free of danger.

It is a well-known fact that some persons, especially the members of certain families, are particularly liable to tuberculosis, and that this liability may be transmitted from the parents to the children; so marked is this liability and so frequent is the development of the disease in families in different generations that the affection was long considered hereditary. We now know that tuberculosis can only be caused by the entrance of the tubercle bacilli into the body and their growth in the body, and this inherited liability simply renders the individual a more easy prey to the germs when once they have gained entrance. The varying susceptibility to tuberculosis, found in different families and in different individuals, is perfectly analogous to that existing with relation to other diseases, only that in the case of tuberculosis the susceptibility is

more general under the natural conditions of exposure to infection than is the case with almost any other disease. It has been argued that if tuberculosis is so widely disseminated as is claimed, and so many tubercle bacilli are discharged by affected individuals, every individual, especially in large cities, must, from time to time, be exposed to infection, and that consequently, if these facts were true as claimed, all persons would, sooner or later, contract the disease. In reply to this, it may be said that the observations of those with the largest experience in performing autopsies show that nearly one-half of all adults living in large cities do, at some time, contract the disease, and it has been said that, in the Vienna General Hospital, which is the largest general hospital in the world, in fully 85 per cent. of dead bodies some tubercular changes are found, and in nearly 45 per cent. of all the deaths occurring in this hospital tuberculosis is the cause. The reason that a still larger percentage of the human race do not contract the disease, or die of it, is because they have sufficient resistance to overcome and destroy the tubercle bacilli which they take in. As it is, on the average about one-third of the deaths between the ages of fifteen and forty-five are caused by this disease, and, probably, in one-quarter more, of the deaths occurring in persons over fifteen years of age, some tubercular changes will be found in the body. This resistance to tubercular infection, which is shown by many persons, is not peculiar to tuberculosis, but exists with relation to all of the infectious diseases. If a number of persons drink typhoid bacilli in water, only a small percentage of them will contract typhoid fever, the others escaping. Similar conditions exist with regard to the other infectious diseases. The frequent occurrence of several cases of pulmonary tuberculosis in a family is then to be explained, not on the supposition that the disease itself has been inherited, as this is of excessively rare occurrence, but that it has been produced after birth by direct transmission from some affected individual. Most of these recurring cases in successive generations in the same family result from direct transmission or house infection. The houses which have been occupied by consumptives become infected, and thus the disease is transmitted to other members of the family. Where the parents are affected with tuberculosis the children, from the earliest moments of life, are exposed to the disease under the most favorable conditions for its transmission, for not only is the dust of the house likely to contain the bacilli, but the relationship between parents and children, especially between mother and child, are of that close and intimate

nature most favorable for the transmission by direct contact. In relation to this I may quote from Dr. Knopf's essay on tuberculosis:

"The most common modes of infection during early childhood are, perhaps, the following: The consumptive mother caresses the child and kisses it on the mouth; she prepares the food, tasting it to judge its temperature and flavor, through the same rubber nipple or with the same spoon the child uses, and thus unconsciously conveys the germs of her disease from her own mouth to that of the child. Later on the child will play on the floor of the room, and should there be a consumptive in the family who, from carelessness or ignorance, is not careful in the disposal of his expectoration, the child is indeed likely to be infected. The little one, while playing on the floor, may with great facility inhale the bacilli floating with the dust in the air and can thus acquire tuberculosis by inhalation, the full development of which may only take place in later years, when the origin will not be thought of. Again, the little child touches everything it can take hold of, infecting its fingers thoroughly, and by putting them in its mouth tuberculosis by ingestion may result and gradually develop into consumption of the bowels. Lastly, should the child's nails be neglected it may scratch itself with the infected fingers, and thus inoculate its system with the disease. Tuberculosis of the skin, or lupus, may result from such an unfortunate accident.

To prevent these infections during childhood is certainly possible by taking the following precautions: Not only should consumptives be religiously careful with their expectoration, but they should associate as little as possible with young children, and stay away from playrooms and playgrounds. We repeat that to kiss children on the mouth should never be allowed and the little ones should be taught never to kiss nor be kissed by strangers. They should be kissed by their own friends and relatives as little as possible and then only on the cheeks. The floor on which the child plays should be kept scrupulously clean. Carpets in such a place are an abomination; they only serve as dust and dirt collectors, and not infrequently harbor the germs of contagious disease. The hands and nails of little children should be kept as clean as possible.

Expectorating on playgrounds should be considered a grave offence and should be punished accordingly. These playgrounds should be kept clean, as free from dust as possible, and daily strewn with clean sand or gravel.

Aside from infection through the inhalation of dust which contains tubercle bacilli, we may have sometimes the disease produced by the ingestion of food containing these germs. It is well known that many domestic animals, and especially cows, are particularly susceptible to tuberculosis, and that the meat and milk of such an infected animal may contain tubercle bacilli. This mode of infection was formerly regarded as a very important one, but the feeling has been growing stronger and stronger among scientific men that this is a less serious source of danger than was formerly believed. Considerable doubt has been thrown upon its occurrence by the observations of Koch.

These observations seem to show that tuberculosis is not readily transmitted from cattle to human beings, although this has not been definitely proven. The explanation of this fact, if true, is that the tubercle bacilli, which cause the disease in cattle, have been somewhat modified in character by long residence in the bovine species, and as a result have lost a portion of their disease-producing power in the human being. This, no doubt, can be readily acquired again under special conditions. We have in other forms of disease illustrations of this same thing. Smallpox and cowpox, or vaccinia, the disease from which vaccine virus is obtained, are undoubtedly both the result of the same kind of an infection. Still, it is difficult to produce cowpox by the direct inoculation of the bovine species with smallpox virus, but if monkeys are first inoculated with smallpox virus, and then the cows inoculated from monkeys, cowpox results, the virus being modified sufficiently in its passage through monkeys to render the cow then susceptible. While, therefore, holding in abeyance a final decision in regard to the danger to human beings from the prevalence of tuberculosis in cattle, it seems quite certain that the seriousness of the danger of infection from this source has been somewhat overestimated. From what has been said, it follows: (1) That tuberculosis is a distinctly preventable disease; (2) that it is not directly inherited, and (3) that it is acquired by direct transmission of the tubercle bacillus from the sick to the well, usually by means of the dried and pulverized sputum floating as dust in the air.

It may be worth while now to estimate briefly the annual cost to the community of tuberculosis.

During the last twenty years there has been a reduction in the death rate from tubercular diseases in New York City of nearly 40 per cent. The total number of deaths in 1901 ascribed to this

disease in New York City was 9,412. For the Boroughs of Manhattan and the Bronx alone, concerning which we have more accurate data for a series of years, we find that during the past twenty years there has been an actual decrease in the total number of deaths, notwithstanding an increase of population; that is, in 1881, the deaths from the tuberculous diseases in the Boroughs of Manhattan and the Bronx numbered 6,123; in 1901, twenty years later, they numbered 6,051. During this time the population of these Boroughs had increased nearly 70 per cent., viz.: from a little over 1,200,000 to more than 2,100,000. Taking now the deaths for the whole of New York City, annually, at 10,000—as we may safely assume that several hundred deaths each year, which should be ascribed to the tubercular diseases, are ascribed to some other cause—we may estimate the economic loss to the municipality. It may be conservatively estimated that each human life, at the average age at which the tubercular deaths occur, is worth to the municipality $1,500. The cost of each life at this age is usually more than this. This gives a total value to the lives lost annually of $15,000,000.

We may further assume that for an average period of at least nine months these persons are unable to work and must be cared for. The loss of their service, during this period, may be estimated at $1 a day, and the cost of food, nursing, medicines, attendance, etc., at $1.50 more per day, making a further loss of $2.50 per day for each person dying for a period of 270 days. This gives us a further loss to the municipality of $8,000,000, making a total annual loss to the city from tubercular diseases of at least $23,000,000. It has been estimated that in the United States annually not less than 150,000 deaths are caused by the tubercular diseases, and estimating the value of these on the basis just given, we have an annual loss to the country of more than $330,000,000.

This method of estimating the importance of the work in the prevention of tuberculosis may seem unfeeling, but it is an economic view, and one which should appeal to the various State and city officials. I have not the slightest doubt, personally, after a very large experience in the sanitary supervision of infectious diseases in New York City, covering many years, that the expenditure of a small part, annually, of this sum, would result in a very rapid decrease in the prevalence of the tuberculous diseases in this country.

A system of registration of all tuberculous cases has been in

force in New York for many years. Last year there were reported to the Department of Health more than 13,000 new cases. It may be safely estimated that this represents less than one-half of the cases actually existing in New York City, for many cases live for several years after they are brought to the attention of the Department, and are only included when originally reported, and many are not reported at all. For example, nearly 5,000 other cases were reported in 1901, which had been previously reported. I think we may safely estimate that 30,000 cases of tuberculosis in a stage of the disease in which it could be easily recognized by a competent physician are present in New York City.

I have had a census of the cases actually under treatment in the hospitals in New York City made annually for a series of years, and the total number never much exceeded 1,000, or less than 4 per cent. of the cases actually present in the city. The vast proportion of the remainder are in tenement houses. I have estimated that the total expenditure in the city of New York in its public institutions for the care and treatment of tuberculous patients is not over $500,000 a year, or not more than 2 per cent. of the actual loss to the city annually. If this annual expenditure were doubled or trebled it would mean a saving of several thousand lives annually, to say nothing of the enormous saving in suffering.

It is now fifteen years since the New York City Health Department first began, in a very small way, its efforts for the prevention of tuberculosis, and these have been rewarded by a reduction in the mortality all out of proportion to the expenditure in money and time which has been made. Still, more has been done in New York than in almost any city in the world. The measures, however, now in force are quite inadequate, as compared with the importance and magnitude of the problem. The sanitary authorities, however enthusiastic and efficient, and the medical profession, however influential and numerous, cannot grapple with this problem unless they have the hearty support of the people and the administration of the city. They must have generous appropriations for carrying on the work—for the provision of medical inspectors and disinfectors, for educational measures, for the establishment of dispensaries and sanatoria for the care of incipient cases, and of homes to which advanced cases may be removed, and where they may be made comfortable until the inevitable fatal termination comes. We must remember, in this connection, that every incipient case and every advanced case

of tuberculosis which is removed from its home and surroundings and placed in a properly equipped and conducted institution is, in this way, not only given a fair chance for recovery of health, but is educated as to the means to be taken to prevent further extension of infection, and, at the same time, one focus of infection is removed from the city. On the average, every case of tuberculosis infects at least one other case, and if removed to a hospital early enough, the infection of this second case would be, in each instance, prevented, and thus the total number of cases would be reduced.

It is in an educational way that lay organizations for the prevention of tuberculosis may be of the greatest service. They serve to arouse interest in and to disseminate knowledge of the nature of tuberculosis; they form compact bodies of public-spirited citizens, whose influence is of the greatest value in so moulding public sentiment that funds shall be forthcoming to erect and maintain dispensaries, sanatoria and homes for the consumptive poor. Through their assistance, and that of the public press, we may hope eventually to obtain State and municipal appropriations for the suitable care of the consumptive poor. New York State has made a small beginning in this way, and it is hoped that the State sanatorium, now in course of erection in the Adirondacks, may lead to very much larger appropriations for this purpose. The State is spending many millions of dollars annually for the care of the insane, and while this is absolutely necessary, for humanitarian reasons, I have no hesitation in saying that far greater returns would be obtained from the expenditure of one-quarter the amount in the prevention and cure of tubercular disease.

I believe that tuberculosis may be practically stamped out. The reduction in the mortality from it in New York City, since 1886, has been about 40 per cent., which means if applied to the Greater City, a decrease of more than 6,000 in the number of deaths annually caused by it. The vast significance of this is still more enhanced when we remember that to a very large extent these deaths take place in the working period, between fifteen and fifty-five years of age. I have no doubt that the measures, first begun in a very small way in New York City fifteen years ago, inadequate as they have been, have resulted in saving the lives of at least twenty thousand persons. The annual deaths in the Greater City still number between nine and ten thousand, and we know that these are, to a very large extent, unnecessary.

THE INFLUENCE OF THE DISCOVERY OF THE RELATION OF BACTERIA TO DISEASE ON THE PRACTICE OF MEDICINE EXCLUSIVE OF SURGERY.

AWARDED THE SCHUYLER ALUMNI PRIZE FOR 1901.

By H. JUDSON LIPES, M.D., Lecturer on Obstetrics, Albany Medical College; Obstetrician to the Albany Guild for the Care of the Sick Poor.

(*Continued from page 234—Preceding Number.*)

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SYMPTOMATOLOGY AND COURSE OF DISEASE IN GENERAL.

We will now endeavor to consider the great changes brought about in our knowledge of the symptomatology and course of the various diseases. Assuredly the discovery of the causal relation of bacteria to disease has not influenced the symptomatology and course of disease *per se,* but the study of bacteriology has done much to bring, and is constantly bringing about, a regrouping and rearrangement of those clusters of signs and symptoms by means of which we have been accustomed to recognize the entities called "diseases."

There are three separate classes of diseases which should be reclassified according to the knowledge we now have of the etiology, diagnosis and symptomatology of disease.

Complex Diseases.—First, there are a number of diseases which we formerly supposed to be single well-defined diseases, which we now know to be complex, that is, may be of several different varieties, each variety produced by a distinct micro-organism. For example, previous to the development of bacteriology, we thought of acute pneumonia as a single well-defined disease. Now we recognize several kinds of pneumonia, and it is possible, to a certain degree, to differentiate the pneumonias according to their causative agents. In order to elucidate this subject, let us consider pneumonia in detail.

1. *"Pneumococcus-pneumonia* corresponds with the character-

istic clinical picture of true croupous pneumonia, with fibrinous exudation into the alveoli, and lobar distribution of the morbid forces. Clinically, this variety is characterized by blood-streaked sputum, and especially by the sudden onset of the disease with a chill, the high, stormy course, and the critical decline of the fever. That this special type of disease is related etiologically to the activity of pneumococci is proved almost with certainty by the following facts: In the first place, in typical cases the diplococcus alone is always found in the diseased area, in which it is demonstrable during life by puncture. In the next place, the general symptoms characteristic of pneumonia are also often present in marked degree, in conjunction with other localizations of the diplococcus, especially pneumococcus-angina. Finally, it may be pointed out in this place that the blood of human beings that have passed through an attack of typical pneumonia with critical defervescence is capable of immunizing animals to pneumococci." Through the researches of bacteriology there is thus furnished evidence that convalescents from this disease are often immune to pneumococci, and it is thus comprehensible why the symptoms disappear abruptly with the occurrence of the crisis, while the pneumonic infiltration remains unchanged.

2. "*Streptococcus-pneumonia* corresponds with the clinical picture of broncho-pneumonia. The infiltrate is only lobular, usually less dense, and associated with less fibrin; the sputum is mucopurulent and not rusty; the onset is not so pronounced; the course is more insidious and attended with remissions and intermissions in the fever (so-called streptococcus-curve) and, above all, the crisis is wanting."

It is not so easy to differentiate this variety, however, since the (3) *staphylococcus-pneumonia,* which is exceedingly uncommon as a single infection, resembles it absolutely; and, secondly, because of the occurrence so frequently of (4) the *mixed forms of pneumonia,* in which two, or even three, of the bacteria named are found together. These forms of the disease furnish clinically also a mixed picture that occupies a position between croupous pneumonia and broncho-pneumonia.

5. *Influenza-pneumonia* is associated with the presence of the influenza bacillus, partly in pure culture, and partly together with streptococci and pneumococci.

6. "The pneumonia complicating tuberculosis in the form of caseous pneumonia may be due to the tubercle bacillus exclusively. On the other hand, pneumonia dependent upon strepto-

cocci, pneumococci and influenza bacilli is, however, not at all uncommon in tuberculous lungs.

7. The pneumonia complicating other infectious diseases is less commonly due to the cause of those diseases—thus we can understand, for example, the cause of a concurrent pneumonia in typhoid fever. In the sequence of diseases of the abdominal organs pneumonia is often associated with the presence of the bacterium coli.

Thus it is clear that we are beginning to recognize clinical types corresponding to the various micro-organisms, and, perhaps, in the near future we will not have to depend, as we have in the past, upon post-mortem examinations to make clear the different types.

Cabot truthfully remarks: "How much more scientific, how much less like the weather predictions of the Yankee fishermen, our text books of medicine would sound if we could say" (as we are beginning to do) "Pneumonia, when due to the micrococcus lanceolatus ends by crisis—when due to the streptococcus by lysis" —and what a Godsend it would be!

General Infectious Diseases.—While we have seen how one disease may have different forms, each due to a special organism, we may see the influence of the results of bacteriological studies in the regrouping of diseases by the union of what we now separate as various diseases—meningitis, endocarditis, peritonitis, etc.—under one heading of general infections. Influenza, tuberculosis, gonorrhœa and typhoid already occupy such a position. Influenza is still influenza, whether it attacks the upper air-passages, the gastro-intestinal tract, or runs its febrile course without any recognizable local manifestation.

Thus we now understand that if we get an endocarditis in the sequence of croupous pneumonia it is undoubtedly due to the diplococcus lanceolatus Fränkel, or if the same lesion exists in the course of gonorrhœal infection the gonococcus of Neisser is to blame.

Mixed Infections.—Our knowledge of the symptomatology and course of certain diseases, which we now know to be mixed infections, has been greatly increased. It is then necessary to point to but one disease—pulmonary tuberculosis—where our conceptions of the symptomatology have been greatly clarified since we began to distinguish the symptoms due to mixed infection with pyogenic cocci or with influenza bacilli from those due to the activity of the tubercle bacillus alone.

PROGNOSIS.

There is probably no department in clinical medicine where we so often blunder as in forming our prognosis of disease. When we better understand the etiology of disease, and when we can be more positive of our diagnosis, we will likewise be better able to prognosticate the probable termination of any given disease.

Bacteriology is helping us, as we shall see, to make our prognoses less meaningless.

For example, although much depends upon the virulence of the exciting agent and the general condition of the patient, we may look for a fatal termination when pneumococci can be demonstrated in the blood of a case of pneumonia. Also the pneumococcus-pneumonia of tuberculous subjects justifies a more favorable prognosis than a purely tuberculous pneumonia under the same conditions.

In empyema the presence of the diplococcus lanceolatus Fränkel is believed to indicate a much more favorable prognosis than that of the other pyogenic organisms, and is likely to heal after relatively rapid tapping, often without permanent drainage.

Coryza carries a much more serious prognosis if the nasal discharge contains the influenza bacilli, and if, in the examination of the exudate in tonsillitis, we find the diphtheria bacillus present, our prognosis is less favorable than if the ordinary pyogenic cocci were alone present. But, owing to the great benefit derived from the use of diphtheritic antitoxin, we may now give, if a case is seen early, a very favorable prognosis in a disease which formerly was almost always fatal.

The prognosis of a profuse, rice-water diarrhœa, etc., is less favorable if, on examination of the stools, we find the cholera bacilli.

It has been found that when the spirochetæ of a case of relapsing fever are rendered motionless within an hour by the blood of another patient, who was passed through one paroxysm and is expecting another, no second paroxysm will occur; while if the spirochetæ are not quieted within two hours, another paroxysm is sure to follow.

In another way the study of bacteriology has aided us to understand the reason why certain unfavorable prognoses have been made. For example, it has for a long time been a prognostic rule clinically, peculiarly in the case of anthrax, that complete apyrexia is a sign of ill omen. We now know that the fever

simply represents a reaction of the organism to the invading parasites, and, therefore, when pyrexia is absent the prognosis is bad.

The most utilized of all bacterial findings for the establishment of a prognosis is when we examine the sputum, perhaps several times to make it a certainty, to determine the presence or absence of the tubercle bacilli in a chronic bronchitis. If these organisms are not found the prognosis is most encouraging.

TREATMENT.

Heretofore the bacteriologist has been compelled to admit that the demonstration of the specific cause in a considerable number of infectious diseases, which had been obtained through his researches, has not resulted in the discovery of a specific treatment for these diseases. But this subject has been so rapidly developed that this admission is no longer correct. We not only now have curative measures unknown before the discovery of the relation of bacteria to disease, but we have most wonderfully developed the more satisfactory preventative treatment.

Besides the development of new methods of treatment, we are now able to comprehend the action of drugs, *e. g.*, quinine in malaria, which were found to be nearly specific in their action. Then, too, we have been able to originate a specific treatment, as for example in hydrophobia, although the causative agent is as yet unknown.

We have found, furthermore, that most diseases are self-limited, and, therefore, the duty of physicians is to treat men suffering from different diseases, rather than to treat the different diseases themselves.

Quite apart from the psychological factors which in the exhilaration of exactness are now generally too much neglected, it must be acknowledged that medicine has, for a long time, shrunk from all questioning about the causes of diseases and cure. In a way, to be sure, the symptoms of disease were considered, but the same prescriptions of large doses of some drug for all symptoms, both great and small, were used. A movement in opposition to this was necessarily provoked, and Hahnemann used, for every disease, only one remedy, without reference to the number and succession of symptoms, and he observed that better results followed with small quantities of the remedy than with large doses. The most extreme position was taken by the Viennese school,

which Hahnemann still dominated. They rested content with observing the course of the malady without giving anything. Hober and Priessnitz achieved remarkable cures by using ordinary water—a remedy everywhere accessible. In Göbersdorf, a now famous sanitarium was founded by Brehmer, who adduced strong proof in opposition to the conclusions of medical empiricism of thousands of years, that the dreaded disease, tuberculosis, is curable by hygienic measures. Much credit is due to Semmelweiss, who taught that the terrible malady, known as puerperal fever, which exceeded in fatality even smallpox and cholera, could be prevented by simple cleanliness.

Hueppe says that there are very different things which may claim to the cure of disease. The cure of tuberculosis by Brehmer's method convinces us that we can actually cure certain diseases by utilizing those conditions which nature herself furnishes in order to convert a given predisposition toward disease into its opposite immunity. This method makes use of external factors, such as air, water and food, to influence the organism of man, and does not concern itself at all with the disease germs—the tubercle bacteria. Both the cure and the duration of the disease are attained by use of the same hygienic factors. Through this method the natural forces of the organism are strengthened, and the organism itself made capable of dealing with its minute invaders.

A cure of another sort is seen when we successfully combat malaria with quinine. Here we introduce into the organism a substance which in certain quantities is a poison; we cast out the devil by the aid of Beelzebub; we take the risk that, perhaps, we may be introducing so much poison into the body that a disease due to the drug may result. The same thing is true when we treat syphilis successfully with mercury or potassium iodide, or rheumatism with the salicylates. It is assumed by some that such substances act antiseptically, and that their efficiency in the body is due to the fact that they destroy the parasites. Quinine neither paralyzes nor kills the parasite. The latter effect would demand relatively large quantities, while the cure of malaria can be brought about by small quantities. The remedy heals simply because it acts as a stimulus, and temporarily exalts the natural forces of the organism. If the cells of the human body are affected more seriously and in larger numbers by some very severe attack, then stronger stimuli, that is to say larger amounts of the drug, are needed.

The reason why a hot bath will sometimes cut short so-called catarrhal or rheumatic processes is that by such a method, through the intervention of the nerves and by the raising of the body temperature, a temporary increased activity of the natural protective forces of the body is induced.

While the cure of disease is at the present time the more important, the aim of scientific research is to prevent disease. To suppress and remove predisposing conditions and to prepare the body to resist and repel the action of exciting agents, we must not only strengthen its powers of resistance, but also make all external media as favorable to it and as hostile to the exciting causes as possible. The former is produced more particularly by carrying out the laws of hygiene, and the latter by following the rules of sanitary science. Both are included in preventative medicine.

Every change in environment, every considerable change in nutrition, may, therefore, make itself felt by its effect upon our predisposition. By utilizing the information gained from experiments along this line, we have at our disposal a means of influencing the disposition in our favor, as, for instance, by the removal of social mal-adjustments, by improvement of the locality in which we dwell, by changes or metabolism through the introduction of better nutriment, or by regulation of the temperature conditions of the body.

It has always been, as it always will be, an art to preserve health and to ward off disease. Hippocrates, among the first to define principles of public health or sanitation, summed up the knowledge of his day under the six headings: Air, Aliment, Exercise and Rest, Sleep and Wakefulness, Repletion and Evacuation, and the Passions and Affection of the Mind. The Greeks cultivated to the extreme both the physical and mental faculties, and had for their motto *a sound mind in a sound body.* The Romans, in their aqueducts for conveying water to the city, and in the cloaca maxima, have left some wonderful examples of sanitary engineering, which are, in certain respects, not yet surpassed.

The development of hygiene as a science, however, has been within comparatively recent years, and is rapidly attracting popular notice and attention. Its rapid development and its present firm basis is entirely due to the work of the bacteriologists, and the promise of the future is even more brilliant than the results and achievements of the past.

In this, as in other civilized countries, much attention has lately

been given to sanitary affairs. The death rate of most of our cities is being progressively lowered, though the populations are constantly increased by large numbers of ignorant and uncleanly immigrants from abroad. Improved sanitary laws are being enacted and enforced, streets are better paved and cared for, houses more properly constructed and ventilated, more attention given to isolating the sick and protecting the well, and the people in general are awakening to the importance of improving as well as maintaining the public health.

Nevertheless, there is still much to be done. Tuberculosis, which causes one-seventh to one-fourth of all the deaths in the civilized world, as well as a number of other infectious diseases, is a preventable disease, and we now not only know the cause, but also have efficient means for a cure in a large proportion of cases, as well as for its general prevention, which is of far more importance.

Sanitation.—Before we had any knowledge of pathogenic bacteria, sanitarians had obtained, by observation and empirical methods, important data upon which to found their recommendations. Their recommendations were, however, often inadequate and contradictory, and without the authority which comes from an experimental basis.

Before the cause of diseases and portals of infection were known, many agents were employed to destroy imaginary germs, which have since been shown to be of little value, or that agents of value were used in too small amounts. Exact knowledge of the usual habitat and of the biological characters of a considerable list of pathogenic bacteria enables us to formulate recommendations, which, if carried out, will doubtless go far toward eradicating the disease induced in man by these infecting agents. For example, the demonstration that tuberculosis is an infectious disease due to a bacterial parasite—the bacillus tuberculosis—at once leads to the recommendation that this bacillus be destroyed wherever it may be found external to the bodies of infected individuals.

Prevention of Tuberculosis.—The fact that it is present in the sputa of patients suffering from tuberculosis, in the milk of cows, and in the tissues of tuberculous animals, leads to a more specific recommendation that the sputa of tuberculous patients should be disinfected; that cow's milk from an unknown source should be sterilized before it is used as a food; and that the flesh of tuberculous animals should not be used as a food.

Prevention of Diseases in Children.—The sterilization of milk,

water and food products has done much to eradicate and to prevent disease. There is nothing so important nor productive of such results as the prevention of various diseases in children, particularly in artificially fed infants, as the proper preparation, and this by sterilization, of their food, which is largely milk. Tyndall is largely responsible for the working out of this method of pasteurization, as it is now termed.

The disinfection of houses after a contagious disease, the isolation of patients suffering from such conditions, when strictly carried out, will do much toward eradicating specific diseases, as was evinced in the recent epidemics at Memphis and New Orleans, and more lately in our own city. Typhus fever has almost entirely disappeared through the enforcement of sanitary laws, and through the technique of the surgeon the dreaded hospital gangrene is no more.

Some one might argue that certain diseases are now more frequent, notwithstanding our present knowledge and practice. This may be true, for children who would have died of smallpox in the eighteenth century now live to be affected with diphtheria or scarlet fever, and the increase in the number of deaths reported as due to cancer is partly due to the fact that a greater proportion of people live to the age most subject to this disease.

Even if we cannot command the extinction of pathogenic bacteria, we can at least fortify the human organism so as to prevent bacterial invasion. According to Bachman ("Monatsche. f. prakt. Wasserheilk."), micro-organisms either settle upon degenerated tissue, from their invading living tissue, and set free their toxins, or directly form poisons from the products of degeneration (auto-intoxication). These products of regressive metamorphosis are especially derivatives of the blood (nekrocytes). Important in understanding the nature of infectious disease is the biological principle that organisms only spread where they find their proper food. As healthy body tissue cannot furnish a soil for microbes, there only remains to consider the used up, cast-off cell material still remaining in the tissue.

Preventative Medicine.—Preventative medicine is therefore concerned in the removing of this material, and all measures which are able to do this must be looked upon as universal therapeutic agents, as baths, mineral waters, hydrotherapy, massage, all cathartics, diaphoretics, diuretics, expectorants, etc. The basis of most diseases consists in products of decomposition, among which the derivatives of red blood corpuscles play the

chief rôle. Pus, mucus, exudates, etc., are of their origin. The business of hygiene, as also of therapy, consists especially in the overcoming of these products of regressive metamorphosis. In this way decomposition will be prevented, which results in the formation of toxin, and in the second place removes the food upon which the micro-organisms flourish.

The future generations, unless the trend of evolution is changed, will doubtless exist without teeth. The proper care of the teeth is of great hygienic importance, and should be insisted upon more thoroughly. Their destruction is due to the acids formed in the mouth as the result of bacterial decomposition, and this could be most easily prevented.

The vastly increased importance to humanity, which the mosquito and other insects have assumed during the past year, renders all that pertains to these pests particularly interesting at the present time. This subject, developed entirely by the bacteriologist through the discovery of the fact that these insects carry the disease germs from one source of infection to another, is already bearing practical results in the destruction, as far as possible, of these scavengers.

Action of Bacteria.—The researches of bacteriologists have established the fact that the pathogenic action of the bacteria, which have been shown to be concerned in the etiology of specific infectious diseases, is due to the formation of toxic products during the active development of the bacterial cell.

Toxins and Toxalbumins.—The discovery of these toxins and toxalbumins has led to a line of research work which has been productive of great results. It was demonstrated that the blood serum of certain animals possesses decided germicidal power. It was further shown, by Ogata and Jasuhara, that the blood of an immune animal injected into a susceptible animal shortly before or after inoculating it with a virulent culture of the anthrax bacillus, protects the animal from a fatal attack of anthrax, and that after its recovery from the mild attack which results, the animal is immune against the action of virulent cultures. It is evident that these facts, now so well established, have immense significance from a therapeutic point of view.

The experiments of Behring and Kitasato showed that the blood of animals which have an artificial immunity against tetanus, or against diphtheria, when injected into susceptible animals, preserves them from fatal infection with virulent cultures of the bacillus of tetanus or of diphtheria. Further, these

bacteriologists have shown that the toxic substance—toxalbumin —present in a filtered culture of the tetanus bacillus is neutralized by mixture with the blood of an immune animal.

Treatment by Use of Anti-Toxins.—The value of the treatment of disease by anti-toxins was early established in traumatic tetanus with tetanus anti-toxin prepared by Cautani and Tizzoni, the noted Italian observers.

With these practical and beneficial results no physician will fail to recognize the fact that medical science has taken a new departure, and that bacteriological studies have led up to practical results of the greatest importance.

Nature's Cure.—Why is it that we now consider many diseases to be self-limited, and how is this phenomenon produced? It is nature's own cure. The production of an anti-toxin during an attack of any one of the infectious diseases would account for recovery in non-fatal cases. If nature adopts this method of cure, we but follow her if we seek to introduce more of the anti-toxin for the purpose of arresting the progress of cases of unusual severity and fatal tendency.

Besides the greatly improved methods employed in preventative medicine, and the immense change produced by the results of bacteriological study in the general treatment of disease, we now have a special mode of counteracting the effect of disease germs by antitoxic or protective sera. These new therapeutic agents vary greatly in their value, and while only a few are markedly curative, the utility of others in selected cases is of importance. The developments in this department are so rapid that we anticipate valuable additions to our means of treatment in the near future.

In producing and using these sera we are simply following out the *vis naturæ*. Nature uses one remarkable method of transforming a predisposition to disease into immunity, and it has been utilized also as a means of curing disease. That the patient who has successfully recovered from certain "specific" infectious diseases becomes protected from a second attack has been known for many years. Thucydides recommended that those who had recovered from the plague at Athens, and had thereby acquired protection, should be employed in the care of the sick. This old idea remains still, and mothers even at the present time adopt the practice of exposing their healthy children to certain infectious diseases with the expectation that the children, when thus exposed intentionally and artificially to the infection, will contract the disease in a milder form than the more susceptible children who have

previous sickened in a natural way, but that the children thus deliberately infected will gain the same amount of protection as the others.

Induced Smallpox.—Artificially induced smallpox was customary in India and China years before the cause of the disease was even conjectured, and was introduced from Constantinople into Western Europe by Lady Montague (1717-1721). European physicians learned the art so well that only an inconsiderable proportion of those treated died of the artificial smallpox inoculation, while an enormous number of men ordinarily perished with natural smallpox.

A Holstein teacher, Pless, and, above all, the English surgeon, Jenner, developed the method of systematic inoculation with the supposedly independent virus of smallpox. The first official inoculation is supposed to have been performed May 14, 1796. The starting point of the serum therapy is the observation that animals, after being successfully infected, regain their health when treated with a subcutaneous injection of the serum of immunized animals.

The method of immunization by means of the blood serum of immunized animals was first suggested by Richet and Héricourt, and devised by Behring and Kitasato. Though demonstrated by the investigators named as useful only for staphylococcus septicæmia, as well as for diphtheria and tetanus, this method is now employed against the infections due to other bacteria.

(*To be continued.*)

"HEALTH DAY."

This is the name of a new legal holiday in Utah, as provided for by recent legislative enactment. By its provisions the first Monday in October is created a legal holiday throughout the State.

On this day it is made compulsory upon every person in the State to clean and disinfect thoroughly dwelling houses, stores, theatres, public halls of all kinds, and, in fact, every building frequented by people.

City Councils, Town Boards, and County Commissioners are instructed to enforce the law, and there is a penalty of $50 for failure on the part of any person to clean up and disinfect as provided.

EDITOR'S TABLE.

SANITARIAN, APRIL, 1903.

Embarrassment incidental to the death of the intended manager, under the new business arrangements, announced in October number, delays the completion of the organization. Meanwhile:
All Communications, business and otherwise, all exchanges and all publications for review, should be addressed to the Editor, as heretofore: Dr. A. N. Bell, 337 Clinton Street, Brooklyn, N. Y.

PHYSICIANS ON ALCOHOL.

Editor THE SANITARIAN:

Three times during the last half century medical manifestos have been issued giving the opinion of physicians on alcohol. The first was issued in 1839, and was signed by 86 persons; the second in 1847, and was signed by 2,000 physicians, and the third appeared in 1871, with the signatures of over 4,000 physicians, including the names of many leading physicians in all parts of the world. A fourth declaration of opinions is now being circulated for signatures, and reads as follows:

"The following statement has been agreed upon by the Council of the British Medical Temperance Association, the American Medical Temperance Association, the Society of Medical Abstainers in Germany, and leading physicians in England and on the Continent. The purpose of this is to have a general agreement of opinions of all prominent physicians in civilized countries concerning the dangers from alcohol, and in this way give support to the efforts made to check and prevent the evils from this source.

"In view of the terrible evils which have resulted from the consumption of alcohol, evils which, in many parts of the world, are rapidly increasing, we, members of the medical profession, feel it to be our duty, as being in some sense the guardians of the public health, to speak plainly of the nature of alcohol, and of the injury to the individual and the danger to the community which arise from the prevalent use of intoxicating liquors as beverages.

"We think it ought to be known by all that:

1. Experiments have demonstrated that even a small quantity of alcoholic liquor, either immediately or after a short time, prevents perfect mental action, and interferes with the function of the cells and tissues of the body, impairing self-control by producing progressive paralysis of the judgment and of the will, and having

other markedly injurious effects. Hence, alcohol must be regarded as a poison, and ought not to be classed among foods.

2. Observation establishes the fact that a moderate use of alcoholic liquors, continued over a number of years, produces a gradual deterioration of the tissues of the body, and hastens the changes which old age brings, thus increasing the average liability to disease (especially infectious disease), and shortening the duration of life.

3. Total abstainers, other conditions being similar, can perform more work, possess greater powers of endurance, have on the average less sickness, and recover more quickly than non-abstainers, especially from infectious diseases, while they altogether escape diseases specially caused by alcohol.

4. All the bodily functions of a man, as of every other animal, are best performed in the absence of alcohol, and any supposed experience to the contrary is founded on delusion, a result of the action of alcohol on the nerve centers.

5. Further, alcohol tends to produce in the offspring of drinkers an unstable nervous system, lowering them mentally, morally, and physically. This deterioration of the race threatens us, and this is likely to be greatly accelerated by the alarming increase of drinking among women, who have hitherto been little addicted to this vice. Since the mothers of the coming generation are thus involved, the importance and danger of this increase cannot be exaggerated.

"Seeing, then, that the common use of alcoholic beverages is always and everywhere followed, sooner or later, by moral, physical, and social results of a most serious and threatening character, and that it is the cause, direct or indirect, of a very large proportion of the poverty, suffering, vice, crime, lunacy, disease, and death, not only in the case of those who take such beverages, but in the case of others who are unavoidably associated with them, we feel warranted, nay, compelled to urge the general adoption of total abstinence from all intoxicating liquors as beverages as the surest, simplest, and quickest method of removing the evils which necessarily result from their use. Such a course is not only universally safe, but is also natural.

"We believe that such an era of health, happiness, and prosperity would be inaugurated thereby that many of the social problems of the present age would be solved."

This declaration has already received the signatures of over 1,000 physicians in all parts of the country. I have been ap-

pointed chairman to present this manifesto to American physicians for their endorsement. I should be very glad to receive the name, title, and address of any physician who is willing to aid, by his signature, to correct public sentiment and assist in the prevention of one of the great evils of the age. This is purely a scientific effort for the purpose of having a general consensus of opinion of the leading physicians of the world, and it is assumed that American physicians are equally enthusiastic and prompt to lend their signatures to this statement as in the wine-drinking countries of Europe. A postal card with address and title is earnestly solicited from every medical man who would like to be represented in this great movement for a clearer comprehension of the subject.

Address, T. D. CROTHERS, M.D.

Hartford, Conn., March 12, 1903.

OBJECTS TO THE WORD "DRUNK."

Magistrate Pool Lets Prisoner Go and Lectures the Policeman!

Because Policeman Hellmers, of the Tremont Station, told Magistrate Pool in the Morrisania Court that his prisoner was habitually drunk the Magistrate discharged the prisoner forthwith, and gave the patrolman a lecture.

"This man is dismissed on the officer's testimony," said the Magistrate. The prisoner was Patrick J. Kerr, forty years old, of 1470 Brook avenue. He then turned to the policeman and said:

"There is no such word as 'drunk' in the Code. It is a common and low word, and a patrolman, or, in fact, no one else should use it."

But who is so ignorant as not to know the meaning of it? And who so blamable as a judge who would palliate its odiousness?

Drunkenness is an odious vice in all cases—at the outset at least—and it should be so treated. Every attempt to show or to maintain its respectability encourages it. And for this THE SANITARIAN endorses and commends

ENGLAND'S RECENT LICENSE LAW.

Of which the following is an abstract, from the "New Voice":

"An act to amend the law relating to the Sale of Intoxicating Liquors and to Drunkenness, and to provide for the Registration of Clubs," as its title declares, was passed by Parliament on August 8, 1902.

It is divided into four parts:

Part I consists of provisions which affect the general body of English laws relating to the sale of intoxicants and the treatment of inebriates.

Part II amends the body of special laws which relate to licenses.

Part III creates an entirely new branch of English law, and relates to the registration of clubs.

Part IV is supplemental, and repeals certain enactments referred to in the "schedule" appended to the Act.

TWO NEW OFFENSES.

In the first division two new offenses are created, viz.:

1. Being "found drunk in any highway or other public place, whether a building or not, or on any licensed premises," appearing "to be incapable of taking care of" oneself. Such a person may be "apprehended and dealt with according to law."

2. Being "found drunk in any highway or other public place, whether a building or not, or on any licensed premises, while having the charge of a child apparently under the age of seven years." Such a person may be apprehended, "and shall, if the child is under that age, be liable, on summary conviction, to a fine not exceeding forty shillings, or to imprisonment, with or without hard labor, for any period not exceeding one month."

A person who, not being amenable to any jurisdiction in lunacy, is, notwithstanding, by reason of habitual intemperate drinking of intoxicating liquors, at times dangerous to himself, or to others, or incapable of managing himself or herself and his or her affairs was defined by "The Inebriates Act," of 1879, as "a habitual drunkard." The new act provides that the wife of such a man can apply for an order that she be no longer bound to cohabit with him; that the legal custody of the children of the marriage (while under sixteen years of age) be committed to the wife; and that the husband pay to the wife, or, for her use, to any officer of the court or third person on her behalf, such weekly sum not exceeding two pounds as the court shall, having regard to the means both of the husband and wife, consider reasonable.

In case the wife be a habitual drunkard, the husband may apply for a corresponding order, and the court may decree that the applicant, besides being freed from the obligation to cohabit with her, shall have the custody of the children and shall pay a weekly sum, not exceeding two pounds, for her support. However, instead of the provision as to cohabitation the court may, with the

consent of the drunken woman, order her to be committed to, and detained in, any retreat licensed under the "Inebriates Acts."

MAY IMPRISON INEBRIATES.

It is possible for the court to detain any convicted inebriate in one of these retreats for a term not exceeding three years.

When, upon conviction of an offender, the court is satisfied that an order of detention is made or not, the court is required by the new law to have notice of the conviction sent to the police authority of the district "in which the court is situate," and the convicted person is to be informed of such notice to the police. Then, "if the convicted person within three years after the date of the conviction purchases or obtains, or attempts to purchase or obtain, any intoxicating liquor at any premises licensed for the sale of intoxicating liquor by retail, or at the premises of any club registered in pursuance of the provisions of Part III of this Act, he shall be liable, on summary conviction, to a fine not exceeding for the first offense, twenty shillings, and for any subsequent offense forty shillings; and if the holder of any license authorizing the sale of intoxicating liquor by retail, whether for consumption on or off the premises, or any person selling, supplying, or distributing intoxicating liquor; or authorizing such sale, supply or distribution on the premises of a club registered in conformity with the provisions of Part III. of this Act, within that period knowingly sells, supplies, or distributes, or allows any person to sell, supply, or distribute intoxicating liquor to, or for the consumption of, any such person, he shall be liable, on summary conviction, for the first offense, to a fine not exceeding ten pounds, and for any subsequent offense in respect of the same person to a fine not exceeding twenty pounds."

The law requires police authority in each jurisdiction to make regulations to secure the giving of information "to licensed persons and secretaries of clubs," of this Act, and of orders made under the section given above. It also requires the police to assist in identification of convicted persons.

ACT RELATING TO CLUBS.

Of Part II, which amends the "Licensing Law," it is unnecessary to say anything. Part III prescribes that "The secretary of every club which occupies a house, or part of a house, or other premises, which are habitually used for the purposes of a club, and in which any intoxicating liquor is supplied to members or

their guests, shall cause the club to be registered in manner provided by this Act."

The registration of the club does not constitute its "premises licensed premises, or authorize any sale of intoxicating liquor therein which would otherwise be illegal."

"The clerk to the justices of every petty sessional division shall keep a register of all such clubs within the division."

The register shall be in a form prescribed by the Secretary of State, and shall contain:

1. The name and objects of the club.
2. The address of the club.
3. The name of the secretary.
4. The number of members.
5. The rules of the club relating to (*a*) the election of members and the admission of temporary and honorary members and of guests; (*b*) the terms of subscription and entrance fee, if any; (*c*) the cessation of ownership; (*d*) the hours of opening and closing; (*e*) the mode of altering the rules.

After certain other regulations concerning registration come sections which specify what shall be offenses in the sale, or supply, or distribution of liquor on the premises of an unregistered club and what the penalty (very severe) for such offenses; and the grounds and proceedings on which a club that has been registered may be struck off the register. "A court of summary jurisdiction, on complaint in writing by any person, may, if it thinks fit," take this action on all or any of the following grounds—viz.: that the club has ceased to exist; that it is not conducted in good faith or is habitually used for unlawful purposes; that there is frequent drunkenness on the club premises; that illegal sales of intoxicating liquors have been made on its premises; that the supply of intoxicating liquors to the club is not under the control of the members, or of the committee appointed by the members, etc., etc.

Section 29 provides that "if a justice of the peace is satisfied, by information on oath," that there is a reasonable ground to suspect that a registered club is so misconducted as to afford ground for striking it from the register, "he may grant a search warrant to any constable authorizing him to enter the club, if need be by force, to inspect the premises, to take names and addresses of persons found therein, and to seize books and papers relating to the business of the club."

The omission by the secretary of a registered club to make such returns as are required by the Act makes him "liable, on sum-

mary conviction, to a fine not exceeding twenty pounds, and, in the case of a second or subsequent offense, to imprisonment with or without hard labor, for a term not exceeding one month, or to a fine not exceeding fifty pounds, or to both."

BRITAIN'S ONLY SALVATION.

London, February 10.—The "Daily Mail" prints a page of statistics showing why the new inebriate act was necessary. It shows that the death rate from alcohol during the last fifteen years has increased by 42 per cent. in men and 100 per cent. in women. In 1892 the drink bill for the United Kingdom amounted to the colossal sum of £140,800,000, or £3 13s. 11d. for each head of the population. The charges of drunkenness heard in the police courts of England and Wales numbered 173,929. There are in the refuges for the insane 10,900 males and 5,800 females, who owe their mental decay to the effects of alcohol.

MORTALITY AND MORBIDITY REPORTS AND REVIEWS.

NEW YORK.—The State is divided into Sanitary districts as follows: 1. *Maritime District:* Includes New York, Brooklyn, Long Island, Staten Island and Westchester County. 2. *Hudson Valley District:* All the counties on either side of the Hudson River, except Westchester, to and including Albany and Rensselaer. 3. *Adirondack and Northern District:* The northern section of the State—the counties of Washington, Warren, Hamilton, Essex, Clinton, Franklin, St. Lawrence, Jefferson and Lewis. 4. *Mohawk Valley District:* Schenectady, Schoharie, Saratoga, Montgomery, Fulton, Herkimer and Oneida counties. 5. *Southern Tier District:* The seven counties along the southeast border of the State. 6. *East Central District:* Sullivan, Delaware, Otsego, Madison, Chenango, Onondaga and Cortland counties. 7. *West Central District:* Cayuga, Tompkins, Seneca, Schuyler, Ontario, Yates, Livingston, Genesee and Wyoming counties. 8. *Lake*

Ontario and Western District: Oswego, Wayne, Monroe, Orleans, Niagara and Erie counties.—Bulletin for January, 1903:

Districts.	Population.	Total number of Deaths.	Death rate per 1,000 pop'n of—	Deaths under five years.	Zymotics per 1,000 —all causes.	Typhoid Fever.	Croup and Diphtheria.	Acute Respiratory Diseases.	Consumption (pulmonary).	Smallpox.	Cancer.
1.....	4,052,875	6,475	19.0	1,797	95	46	219	1,296	816	2	260
2.....	696,000	1,005	17.4	136	68	21	11	182	114	—	40
3.....	394,772	505	15.9	94	54	11	3	71	93	—	17
4.....	420,000	562	16.0	108	84	8	12	74	49	—	24
5.....	429,530	520	14.5	78	75	15	14	66	28	—	23
6.....	403,000	541	16.0	71	57	7	7	38	17	—	28
7.....	320,600	431	15.5	53	40	6	2	52	26	—	19
8.....	893,819	1,107	14.5	219	180	38	20	185	18	18	56

Typhoid Fever.—"For the last two or three years Ithaca has had an autumnal prevalence of typhoid fever. About the middle of January began a winter outbreak, abrupt in its origin, universal in distribution, save the university and certain new parts of the city, and extensive, several hundred cases occurring within a few weeks." But little or no notice seems to have been taken of it. What was said in our previous issue has been more than justified since by the reports to the New York 'Times' by an accomplished expert.—Special to the New York "Times," March 10:

"The best data obtainable as to the status of the typhoid epidemic here are admittedly incomplete. They show that up to the end of last week there had been 755 cases of typhoid in Ithaca since January 10, of which the clinical history is obtainable. The number of unreported cases is a matter of estimate. In view of the fact that most physicians have neglected, and that some have refused, to make returns, and that in death certificates some of them persistently refrained from assigning causes likely to be recognized as typhoid complications, I venture the opinion that the number of cases, light and grave, occurring up to this time since the present epidemic began, would be conservatively estimated at 1,000. . . .

"Typhoid has been more or less prevalent here for many years, and at no time has Ithaca long been free from it. For at least ten years the cautionary signals have been obvious to any one who might have chosen to look for them. . . . When shortly after the beginning of this year, cases of 'continued fever' were reported, the physicians looked wise and remarked to one another that it

was a recurrence of the 'Ithaca fever.' It rapidly assumed epidemic form, and then they manifested great reluctance to admit any connection between it and the fever of a year before. Perhaps it was more discreet to regard the typhoid outbreak of this year as a *de novo* experience. By January 15 it had gained alarming headway, and the admissions to the City Hospital and University Infirmary were at the rate of ten to twenty a day. . . .

"The town has four distinct water-distribution areas, and one in which there is no distribution. One of these is the campus, supplied from Fall Creek. No typhoid has occurred there. To two areas supplied by the company water is furnished from Six Mile Creek and Buttermilk Creek, respectively. It is not probable that the infection was planted impartially in both streams. The one polluted is popularly supposed to have been the Six Mile Creek, but a study of the repeated occurrences of typhoid in these two areas shows that one is practically no safer than the other. . . .

"There has been no recognized case of typhoid fever treated by any physician anywhere in or along the watershed of the Ithaca Water Company. No member of the construction gang, which was dispersed on Thanksgiving Day, nearly six weeks before the first case appeared in Ithaca, is known to have lost a day by illness of any kind. Not one fact has been produced which contains the assumption that this colony brought typhoid fever into the Six Mile Valley or left it there. . . .

"The blind and unreasoning popular hostility to the Ithaca Water Company is illogical, and in view of the readiness of the management of the water company to do all that can be done in co-operation with the town and university authorities, it is calculated to delay, and perhaps defeat, a solution of the question of a pure and satisfactory water supply."

Again, March 12 and 13:

"In point of fact, Ithaca is a very dirty town, full of ancient evils which are the survival of its village days, and of a kind which, if intolerable under village conditions, quickly become intolerable from the point of view of the sanitarian as population increases and dwellings rub elbows or stand shoulder to shoulder in solid blocks. . . .

"The amount of carelessness in connection with the present typhoid epidemic, and of kinds scarcely admitting of description, shows that the local physicians have been extremely negligent or that the people of the town have persistently disregarded their instructions. Perhaps the truth includes both assumptions. The

seeds of infection have been scattered broadcast all over the town. . . .

"Fortunately the direction of affairs has been assumed by Dr. George A. Soper, selected for this service by the State Board of Health. He is a competent, experienced, energetic man, with no illusions and a full realization of the responsibilities of his position and the gravity of the situation. He has planned a sanitary campaign which the Common Council has ratified by giving the Board of Health *carte blanche* and a practically unlimited credit. . . .

"The water problem, the solution of which will be found in the filtration of the Six Mile Creek supply—whether under private or municipal ownership, is immaterial—is in the best hands to be found to solve it. Mr. Allen Hazen, C.E., whose prominent identification with work of this character is well known, is here with plans for a filtration plant. Prof. E. O. Jordan, of the University of Chicago, who is conducting the most important series of experiments ever undertaken of their kind in connection with the question of the effect of the sewage discharge through the Chicago drainage canal upon the health of St. Louis, is also here to study the situation. The water company is well advised, and its decision will undoubtedly be the wisest which can be reached in the circumstances."

J. G. BAYLES.

New York City, 3,632,501. Report for the quarter ending December 31, 1903. Total mortality, 15,224; deaths under five years of age, 4,557; deaths from typhoid fever, 300; malarial fevers, 21; smallpox, 3; measles, 55; scarlet fever, 113; whooping cough, 79; diphtheria and croup, 523; influenza, 35; other epidemic diseases, 66; tuberculosis pulmonalis, 1,849; tubercular meningitis, 137; other forms of tuberculosis, 102; cancer, malignant tumors, 611; meningitis, simple, 184; apoplexy, congestion and softening of brain, 672; organic heart disease, 1,175; acute bronchitis, 474; chronic bronchitis, 112; pneumonia (excluding broncho-pneumonia), 1,339; broncho-pneumonia, 706; diseases of stomach (cancer excepted), 138; diarrheas (under 2 years), 559; hernia, intestinal obstruction, 123.

There were 677 less deaths recorded, and a lowered death rate of 1.21 points per thousand was noted in the fourth quarter of the year 1902, as compared with the corresponding quarter of the year 1901; the one feature of this decrease standing out more prominently than any other was the number of deaths from the

communicable diseases, all of which showed a considerable decrease, with one exception: typhoid fever, to which 44 more deaths were attributed than in the last quarter of the year 1901. This death rate was 16.64.

For the year 1902, total number of deaths, 68,112. Under 5 years, 24,390; death rate, 18.75. Deaths from typhoid fever, 765; malarial fever, 125; smallpox, 310; measles, 710; scarlet fever, 940; whooping cough, 606; diphtheria and croup, 2,015; influenza, 157; other epidemic diseases, 402; from tuberculosis of the lungs, 7,571; tubercular meningitis, 794; other forms of tuberculosis, 518; cancer, 2,451; simple meningitis, 1,033; congestion, hemorrhage and softening of the brain, 2,533; organic diseases of the heart, 4,859; acute bronchitis, 1,898; chronic bronchitis, 385; pneumonia, 6,134; broncho-pneumonia, 3,126; diseases of the stomach, 603; infantile diarrhea, 4,938; hernia and intestinal obstructions, 490; cirrhosis of the liver, 746; nephritis and Bright's disease, 5,461; non-cancerous tumors, 331; puerperal septicemia, 250; other puerperal diseases, 392; congenital debility and malformation, 3,086; senile debility, 959; violent deaths, 3,753, of which, suicide, 752; other diseases, 8,137; ill-defined causes, 1,517.

CALIFORNIA.—Los Angeles, 135,000. Report for February: Deaths, 217—36 under 5 years; death rate, 16.07. From diphtheria, 2; scarlet fever, 6; typhoid fever, 5. There were 47 deaths from tuberculosis, divided as follows: Natives of Los Angeles, 1; natives of the Pacific Coast outside of Los Angeles, 3; from other parts, 43; 19 had lived here less than three months, 5 between three and six months, 5 between six and twelve months, 8 between one and five years, 6 between five and ten years, 13 over ten years; unknown, 1.

COLORADO.—Denver, 150,000. Report for January, 1903: Deaths, 235—41 under five years. Premature and still births, 5; from phthisis, 51—49 contracted elsewhere; diphtheria, 3; typhoid fever, 3; erysipelas, 4; scarlet fever, 2. Death rate, 17.09. Cases of infectious disease reported: Diphtheria, 69; scarlet fever, 85; measles, 3; typhoid fever, 3; smallpox, 34; erysipelas, 5; chickenpox, 3. Smallpox in Denver, 25—9 outside.

CONNECTICUT.—Mortality report, as per bulletin for February, 1,294, 124 less than in January, 170 more than in February of last year, and 98 more than the average number of deaths in January

for the five years preceding. The death rate was 17.5 for the large towns, for the small towns 16.1, and for the whole State 17.1. The deaths reported from infectious diseases, including diarrhœal, were 312, being 24.1 per cent. of the total mortality.

Cases of infectious diseases reported: Smallpox, in 6 towns, 47; measles, in 66 towns, 1,099; scarlet fever, in 55 towns, 339; cerebro-spinal fever, in 2 towns, 3; diphtheria, in 43 towns, 170; whooping cough, in 40 towns, 344; typhoid fever, in 12 towns, 20; consumption, in 6 towns, 12.

ILLINOIS.—Statement of mortality for the week ended March 14, 1903, compared with the preceding week and with the corresponding week of 1902. Death rate computed on estimated populations of 1,885,000 for 1903 and 1,820,000 for 1902:

	*Mch.*14, 1903.	*Mch.*7, 1903.	*Mch.*15, 1902.
Total deaths, all causes	631	595	554
Annual death rate per 1,000	17.44	16.45	15.86
Under 1 year	103	104	136
Between 1 and 5 years	64	58	57
Bright's disease	39	21	23
Bronchitis	35	37	28
Consumption	60	63	59
Cancer	15	18	22
Diphtheria	15	8	11
Heart diseases	31	49	39
Influenza	19	14	6
Measles	6	4	4
Pneumonia	133	130	116
Typhoid fever	13	11	4
Scarlet fever	4	6	11
Suicide	17	10	5
Violence (other than suicide)	20	20	22
Whooping cough	10	8	3

DISTRICT OF COLUMBIA, 293,667—89,632 colored. Deaths during the week ended February 28, 145. Of these 87 were of white persons and 58 colored. The death rate for the whites was 21.8, for the colored 32.6, and for all the deceased 25.3. In the previous week the mortality was 161, representing a death rate of 28.4, and in the corresponding period of last year it was 106, the death rate

being 18.8. Compared with the previous week, deaths from diseases of the brain and nervous system increased from 12 to 18, and consumption from 15 to 21; while those from acute lung affections declined from 40 to 32, and of the kidneys from 14 to 10. There were 2 fatal cases of typhoid fever, 4 of whooping cough, 4 of measles, and 8 of grippe. By violence but one death occurred, due to an accidental fall.

IOWA.—Outbreaks of infectious diseases were reported to the Secretary of the State Board of Health during January as follows: Diphtheria in 10 localities; measles, 6; scarlet fever, 25; typhoid fever, 3; smallpox, 36 localities, 164 cases.

LOUISIANA.—New Orleans, 310,000—83,000 colored. Report for February: Total deaths, 521—192 colored; 100 under 5 years —42 colored. Annual death rate, white, 17.39; colored, 27.35: 20.16. Deaths from typhoid fever, 4; diphtheria and croup, 5; pneumonia, white, 24; colored, 15; tuberculosis of the lungs, white, 39; colored, 35; influenza, 12; Bright's disease, white, 36; colored, 17; cancer, 20—7 colored.

MASSACHUSETTS.—Boston, 592,038. Report for December, 1902: Deaths, 944—248 under 5 years; still births, 63; death rate, 19.13. Deaths from typhoid fever, 16; smallpox, 20; scarlatina, 13; whooping cough, 16; diphtheria, 14; tubercle of the lungs, 91; organic diseases of the heart, 81; bronchitis, acute, 27; chronic, 12; pneumonia, 90; broncho-pneumonia, 42; acute nephritis, 46; Bright's disease, 14; cancer, 33. Contagious diseases reported: Chickenpox, 61; cerebro-spinal meningitis, 2; diphtheria and croup, 146; tuberculosis, 56; measles, 44; scarlatina, 149; smallpox, 85; typhoid fever, 91.

Summary for the year 1902: Population, 586,553; total deaths, 10,983; death rate, 18.73. Deaths from zymotic diseases, 3,098—28 per cent. of total mortality. Deaths under 5 years of age, 3,368—30.66 per cent. of total mortality. Deaths from diphtheria and croup, 225; pulmonary and laryngeal tuberculosis, 1,211; bronchitis, 339; pneumonia, 1,115; smallpox, 190; typhoid fever, 139; whooping cough, 132; Bright's disease, 187; cancer, 482.

MICHIGAN.—The Secretary of the State Board of Health reports for February, 1903, compared with the preceding month, diphtheria was more prevalent, and typhoid fever was less prevalent. Compared with the average for February in the ten years,

1893-1902, scarlet fever, measles, smallpox and whooping cough were more than usually prevalent; and consumption, intermittent fever and remittent fever were less than usually prevalent. For the first time this season, influenza headed the list of those diseases which usually cause the most sickness in Michigan, but was *fourteen per cent. less prevalent than the average for February* in the preceding ten years. Bronchitis, rheumatism, neuralgia and pneumonia were also less prevalent than usual. As these diseases prevail most during or following the time when the atmosphere is cold, dry, and contains an excess of ozone, the lessened prevalence of these diseases was probably due to the higher than average temperature, the less than average ozone, and the excessive precipitation, that being twice as much in the February just passed, as the average of the past ten years.

Of the most dangerous communicable diseases, meningitis was reported present in Michigan during the month of February, 1903, at 9 places; whooping cough at 46 places; diphtheria at 77 places; typhoid fever at 89 places; measles at 103 places; scarlet fever at 179 places; consumption at 193 places, and smallpox at 201 places.

March 7.—Since the first of January, 1903, 250 new *outbreaks of smallpox* have been reported, 129 final reports of outbreaks closed have also been received, and in 90 instances, or 70 per cent. of those outbreaks, the disease was restricted to the one house where the first case occurred.

The total number of deaths returned to the Department of State for the month of February, was 2,756, 100 fewer than the number of deaths in the preceding month. The death rate was 14.4 per 1,000 of population, as compared with 13.5 in January. The mortality was slightly higher than that for February of the preceding year. There were 559 deaths of infants under 1 year, 175 aged 1 to 4 years, and 874 deaths of persons aged 65 years and over.

Important causes of death were as follows: Tuberculosis of the lungs, 182; other forms of tuberculosis, 35; typhoid fever, 34; diphtheria and croup, 52; scarlet fever, 16; measles, 17; whooping cough, 31; smallpox, 5; pneumonia, 372; influenza, 73; cancer, 126; accidents and violence, 134.

There was a decrease in the number of deaths from typhoid fever and scarlet fever, while the number reported from influenza was nearly double the number in January. The death rate from this cause, however, was not as high as during the same time last year.

MISSOURI.—St. Louis, 645,000—40,000 colored. Report for January, 1903: Total deaths from all causes, 919—216 under 5 years; death rate, white, 16.16; colored, 26.0: 21.8. Deaths from smallpox, 1; measles, 1; scarlatina, 7; diphtheria and croup, 32; whooping cough, 6; typhoid fever, 15; phthisis, 86; bronchitis, 44; pneumonia, 118; Bright's disease and nephritis, 52; cancer, 36.

NEW JERSEY.—Newark, 266,000. Report for the week ending March 7: Deaths, 108—21 under 5 years; death rate, 21.11. Deaths from scarlet fever, 2; la grippe, 5; phthisis, 13; gangrene, lung, 16; empyema, 6. Contagious and infectious diseases reported: Diphtherian-croup, 17; scarlet fever, 11; typhoid fever, 3; smallpox, 3.

NORTH CAROLINA.—Bulletin of State Board reports for January, 1903: Twenty-six towns with an aggregate population of white, 83,250; colored, 58,850: 142,100. Aggregate deaths, 178—83 colored; 39 under five years of age; still born, 9. Death rates, white, 12.2; colored, 18.9: 15.0.

Deaths from typhoid fever, 5; malarial fever, 2; diphtheria, 3; consumption, 20; pneumonia, 32; smallpox reported in 31 counties, an aggregate of 316 cases, no deaths; varicella, many cases in Cumberland County and several in Jones.

OHIO.—Cleveland, 420,000. Report for February, 1903: Deaths, 549—202 under 5 years; annual death rate, 15.68. Deaths from typhoid fever, 23; smallpox, 8; diphtheria and croup, 16; tuberculosis of the lungs, 44; bronchitis, 17; pneumonia, 55; broncho-pneumonia, 14; organic disease of the heart, 15; Bright's disease, 16; cancer, 15.

PENNSYLVANIA.—Philadelphia, 1,349,712. Report for week ended February 28, 1903: Deaths, 639—186 under five years. Deaths from consumption, 69; typhoid fever, 22; diphtheria and croup, 14; whooping cough, 7; smallpox, 1; cancer, 8.

Pittsburg, 354,000. Report of the Bureau of Health for week ended February 28, 1903: Deaths, 136—59 under five years; annual death rate, 19.97. Deaths from typhoid fever, 5; whooping cough, 13; diphtheria and croup, 6; measles, 23; smallpox, 6; consumption, 6; pneumonia, 27; cancer, 1.

Cases of infectious diseases reported: Smallpox, 15; diphtheria and croup, 24; scarlet fever, 12; typhoid fever, 34.

WASHINGTON.—Seattle, 115,000. Report of the Department of Health for January, 1903: Total number of deaths, 91—10 under five years. Death rate, 9.52. Deaths from pulmonary consumption, 11; pneumonia, 8; typhoid fever, 3; cancer, 3.

WISCONSIN.—Milwaukee, 300,000. Report for January, 1903: Deaths, 355—191 under five years. Annual death rate, 13.27. Deaths from typhoid fever, 7; whooping cough, 15; measles, 2; diphtheria and croup, 12; tubercular diseases, 32; bronchitis, 20; pneumonia, 66; cancer, 20.

Cases of infectious disease reported: Smallpox, 21; tuberculosis, 2; diphtheria, 59; scarlatina, 20; typhoid fever, 10.

PORTO RICO, 953,947. Superior Board of Health reports for January, 1903: Total deaths, 2,173—859 under five years. Death rate, 27.3; still births, 115. Deaths from cerebro-spinal fever, 22; diphtheria, 2; typhoid fever, 6; pneumonia, 68; puerperal fever, 11; diarrhœal diseases, 34; anemia, 538; bronchitis, 103; tuberculosis, 112; heart diseases, 37; accidents and violence, 23.

SANITARY CONDITION OF HAVANA.

Briefly summed up reports of the Military Governor of Cuba for the years 1899 and 1900 show that Havana was practically converted from a very unhealthy into an exceedingly healthful city through a very comprehensive system of cleaning the sewers, cleaning the streets, cleaning the public buildings, cleaning the hospitals, orphan asylums, and similar institutions, and placing them in sanitary condition by plumbing and sewerage systems; by creating isolated hospitals and placing cases of infectious diseases therein; by a continual thorough disinfection of the sewers and streets by the use of electrozones; by the inspection of stables, bakeries, butcher shops, hotels, cafés, stores, etc.; by a house-to-house inspection, whereby all the houses in the city were inspected every two months; and by the installation of a sanitary system of plumbing wherever the sanitary condition of a house demanded the same, and in the construction of all new houses. As this system brought about, to a great extent, healthful conditions in Havana, it follows that the relaxation of that system will bring about the former unsanitary conditions to a greater or less degree. It is believed that such a relaxation is gradually but surely taking place. —Consular Reports.

BOOK-REVIEWS.

THE INTERNAL SECRETIONS AND THE PRINCIPLES OF MEDICINE.—By CHARLES E. DE M. SAJOUS, M.D., Fellow of the College of Physicians, Philadelphia; Member of the American Philosophical Society, the Academy of Natural Sciences, Philadelphia, etc.; Knight of the Legion of Honor and officer of the Academy of France; Knight of the Order of Leopold of Belgium, etc. Formerly Lecturer on Laryngology, Jefferson Medical College, and Professor of Laryngology and Dean of the Faculty, Medico-Chirurgical College; formerly Professor of Anatomy and Physiology in the Wagner Institute of Science. *Volume First:* Physiology, General Pathology, General Therapeutics, Immunity. With Forty-two Illustrations. 8vo, pp. xxvi-800. Price, in Cloth, $6.00 per vol.; In half Russia, $7.00 per vol. Two vols., respectively, $12.00 and $14.00. Philadelphia: F. A. DAVIS COMPANY.

A book of new ideas on an old subject, particularly the *pituitary body,* which always has been a subject of interest, not only to the medical profession, but to naturalists as well, but never before so thoroughly investigated as it has been for several years by the author of this volume. It bears evidence throughout of the author's mastery of all contributory knowledge to his purpose by other investigators, as a means of opening his way and strengthening his conclusions. "Tissue respiration," he says, prefatorily, "being obviously the dominant factor of all the problems we hoped to solve, we thought it advisable to leave the beaten paths and seek clues among subjects which had never been associated with this physiological function.

" . . . Among the subjects which had received attention during our preliminary inquiry was the physiology of the ductless glands. We deemed it advisable to ascertain, first of all, whether the physiological functions of the adrenals were sufficiently similar in all vertebrates to warrant the use of experimental data obtained with lower animals in the study of these organs in man. Such proved undoubtedly to be the case, and we cannot but feel that the results of our investigations—those we will now submit—are based upon solid premises.

" . . . The secretion of the adrenals was traced as far as the pulmonary alveoli, but not beyond. Here it was found to hold in

combination the various constituents of hæmoglobin, and to endow both the latter and the plasma with their affinity for oxygen. Prevailing views as to the chemistry of respiration were thus radically transformed, and our knowledge of the manner in which the blood-pigments were held together, likewise. We likewise ascertained that methæmoglobin (hæmatin) and hæmatoporphyrin (hæmatoïdin) were the component bodies of hæmoglobin thus held in association, and that hæmoglobinuria, methæmoglobinuria, and hæmatoporphyrinuria indicated successive stages of hæmoglobin dissociation incident upon adrenal insufficiency. We subsequently ascertained that the red corpuscles were secondary factors in this important function, *i. e.*, mere carriers, pack-mules, as it were, and that it was the oxygen-laden adrenal secretion dissolved in the plasma itself which carried on all the oxidation processes of the organism.

"The many physiological problems awaiting solution then appeared to us in quite a new light. The ease with which the oxygen carried by the plasma could penetrate the minute vascular net-works of all cellular elements not only furnished a clue to the physiological chemistry of the latter, but it also led to the discovery that various structures the functions of which were unknown were in reality blood-channels, or rather plasma-channels. The overwhelming importance of the internal secretion of the adrenals having been determined, the functions of the other ductless glands were studied. Our investigation then showed that the adrenals were directly connected with the *anterior pituitary body* through the solar plexus, the splanchnic nerves, and the cervicothoracic ganglia of the sympathetic. Indeed, this diminutive organ, hardly as large as a pea, and now thought to be practically functionless, proved to be the most important organ of the body, as governing center of the adrenals, and, therefore, of all oxidation processes.

"In general diseases what has been termed the patient's 'vitality,' or 'vital resistance,' thus became ascribable to fluctuations in the anterior pituitary body's functional efficiency. In other words, overactivity of this organ, by correspondingly enhancing the production of adrenal secretion, was found to increase metabolism and the activity of all functions in proportion; while depression of its normal activity, by inhibiting the production of adrenal secretion and thus reducing the quantity of oxygen distributed throughout the entire organism, proportionally lowered the activity of all vital processes. But the manner in which the

functional efficiency of this organ was maintained had also to be elucidated. This led us to the *thyroid gland,* whose physiological purpose, we found, was to sustain the functional efficiency of the anterior pituitary body up to a certain standard by means of its secretion: iodine in organic combination. Excessive production of this secretion, by causing overstimulation of the anterior pituitary body, gave rise, when prolonged, to 'exophthalmic goiter'; while reduced production of thyroid secretion, by inhibiting the functions of the anterior pituitary body, caused myxœdema. The thyroid gland, the anterior pituitary, and the adrenals were thus found to be functionally united: *i. e.,* to form an autonomous system, which we termed the 'adrenal system.'

"Further investigation in this direction showed that the action of thyro-iodine upon the anterior pituitary body represented that of *any* poison introduced into the blood-stream. In other words, it became evident that, instead of acting directly upon the blood or cellular elements, poisons either stimulated or depressed the functional activity of the adrenal system, thus increasing or reducing the production of adrenal secretion, and, therefore, of oxidizing substance in the plasma. Radical changes in prevailing doctrines as to the manner in which general infections, or other forms of poisoning, produced their effects on the organism thus seemed to impose themselves. In fact, the mass of confirmatory evidence found on all sides (including the effects of removal of the adrenals, the thyroid, or the anterior pituitary body, and of the use of adrenal and thyroid extracts) proved to be incontrovertible. We were thus led to conclude that what are now considered as symptoms of infection or poisoning are all manifestations, more or less severe, of *overactivity or insufficiency of the adrenal system.* Indeed, *the physiological action of remedies was also traced to the anterior pituitary body,* the governing center of this system.

"The bearing of this discovery upon the prevailing interpretation of the pathogenesis and treatment of disease is well shown by the manner in which it at once elucidated our knowledge of even the greater scourges of humanity. The symptomatology of Asiatic cholera, for example, was found to be a counterpart of the symptom-complex of advanced adrenal insufficiency, and due to the effects of cholera-toxins upon the anterior pituitary body. The only treatment of any value whatever, as is well known, is early and active stimulation: *i. e.,* the use of agents which, as does the thyroid's active principle, reawaken the functional activity of this organ. Cholera infantum, arsenic poisoning, various toxalbu-

mins, and other intoxications produce identical symptoms; all these proved likewise to be syndromes due primarily to adrenal insufficiency. Pulmonary tuberculosis also asserted its identity as a disease due to lowered functional activity of the adrenal system: either inherited or acquired.

"The *posterior pituitary body,* far from being the insignificant vestigial organ it is generally thought to be, was found by us, thanks mainly to the investigations of Berkley, Andriezen, Howell, and de Cyon, to stand second in importance only to its mate, the anterior pituitary body. Indeed, it proved to be the *chief functional center of the nervous system,* its numerous groups of neurons forming the starting-point, or highly specialized center, of a single class of nerves. The various medullary centers thus became mere connecting nuclei, which, stimulated or injured, however, could become the source of all the morbid phenomena recorded by physiologists.

"The *pancreas and spleen* may be considered jointly, since, as long ago asserted by Schiff, the secretions of these two organs unite in the formation of a powerful proteolytic ferment, a process subsequently defined by Herzen as the one leading to the conversion of trypsinogen into trypsin: the albumin-solving constituent of the pancreatic juice. While confirming this view, our own analysis led to the conclusion that, in addition to the trypsin supplied to the intestinal canal, a portion of this ferment passed into the splenic vein as an *internal secretion* and thence into the portal vein. We also ascertained that this ferment played a leading part in all immunizing processes, its main function in the blood-stream being to destroy toxic albuminoids. These, as is well known, include all toxins and diastases secreted by bacteria, proteids, toxalbumins, vegetable poisons, and venoms.

"*Immunity,* or rather the various subjects usually grouped under this heading, seems to us to have also acquired a number of elucidative factors. The investigations of Metchnikoff, Ehrlich, Bordet, Pfeiffer, and others were not only sustained in many particulars, but the solidity of many of their deductions was shown by the fact that the addition of considerable new evidence only served to harmonize their views. Phagocytosis proved to be the preponderating factor of immunizing processes; but the splenopancreatic internal secretion, trypsin, to which we have just referred as the organic body which reduced toxic albuminoids to inert cleavage products, was found to be the agency which digested

bacteria in the digestive vacuoles of phagocytic leucocytes. Indeed, Metchnikoff had found this body to be a trypsin.

"Briefly, our inquiry seems to us to have shown that the adrenal system is the source of the secretion which, with the oxygen of the air, forms the oxidizing substance of the blood-plasma. It has also revealed, we believe, the origin and mode of distribution of the bodies with which the oxygen directly or indirectly combines: *i. e.*, peptones, myosinogen, fibrinogen, hæmoglobin, and myelin, to insure the continuation of life and the efficiency of all organic functions. Finally, it has suggested that in addition to these agencies, all leucocytes and, under certain circumstances, the plasma, contain a protective agency, trypsin, which, with Metchnikoff's phagocytic cell, serves to destroy micro-organisms and convert their toxins and other albuminoid poisons into harmless products. Considered jointly, these various factors seem to us to represent the aggregate of vital phenomena.

"The foregoing summary can only be said to include some of the more important processes, physiological and pathological, studied in this volume. A comprehensive study of the nervous system and of the functional processes in the various organs, as modified by the presence of previously unrecognized structures, the formation of glycogen, urea, etc., the protective processes in the intestinal canal and respiratory surfaces, could not be satisfactorily summarized. The same may be said of Addison's disease, acromegalia and chlorosis, the pathogenesis of fever, the identity of the Widal reaction, the so-called gouty diathesis, glycosuria, cancer, the causes of the predilection of children to certain infectious diseases, the action of a large number of remedies upon the adrenal system, etc."

It is the most important contribution to progressive medicine since Lister's introduction of Sanitary Surgery.

DISEASES OF THE SKIN, THEIR DESCRIPTION, PATHOLOGY, DIAGNOSIS, AND TREATMENT, WITH SPECIAL REFERENCE TO THE SKIN ERUPTIONS OF CHILDREN, AND AN ANALYSIS OF FIFTEEN THOUSAND CASES OF SKIN DISEASE.—By H. RADCLIFFE-CROCKER, M.D. (Lond.), F.R.C.P., Physician for Diseases of the Skin in University College Hospital; Honorary Member of the American Dermatological Society; Membre Correspondant Etranger de la Société Française de Dermatologie; Correspondierendes Mitglied der Wiener Dermatologischen Gesselschaft; Socio Onorario della Società Italiana di Dermatologia e Sifilografia; Late Physician to the East London Hospital for Children; exam-

mer in Medicine, Apothecaries' Hall, London. *Third Edition, Revised, Rewritten and Enlarged.* With Four Plates, two of which contain Twelve Colored Figures, and 112 other Illustrations. 8vo. 1400 pp. Cloth, $5.00; Sheep, $6.00, net. Philadelphia: P. BLAKISTON'S SON & Co.

So long has been the acknowledged excellence of "Crocker's Diseases of the Skin," that the mere announcement of "The Third Edition" supersedes the necessity of a review; and the more, since this revised and enlarged edition comes at a time when recent progress in dermatology makes an authoritative work upon the subject a positive necessity.

It is a safe, accurate, eminently practical and strictly modern treatise, well and clearly written by a man of large experience and most excellent judgment. Though completely scientific, it is written in such a happy manner that the tyro may follow the writer almost as readily as the expert on diseases of the skin. It will be seen, therefore, that it appeals to general practitioners as well as specialists, while to the student it will serve as a valuable guide when he enters upon the more arduous task of practice.

The etiology, symptomatology, pathology and minute anatomy, constitutional conditions, diagnosis and treatment of each disease mentioned is fully entered upon; the therapeutics, dietetics and general regimen coming in also for their due share of attention; great strength in the accuracy of statement and method and clearness of definition and differentiation being shown. The newer remedies and bacteriological researches, in their bearing upon dermatology, are carefully noted. The illustrations, too, showing as they do the morbid conditions of the different structures affected in diseases of the skin, are a not unimportant feature. The whole book has been systematically gone over, and numerous changes made where recent progress in dermatology and a more exact knowledge of the subject has dictated. The result is a work every page of which bears the impress of thoroughness and large personal experience.

THE AMERICAN YEAR-BOOK OF MEDICINE AND SURGERY FOR 1903.—A yearly Digest of Scientific Progress and Authoritative Opinions in all branches of Medicine and Surgery, drawn from journals, monographs, and text-books of the leading American and foreign authors and investigators. Arranged, with critical editorial comments, by eminent American specialists, under the edi-

torial charge of GEORGE M. GOULD, A.M., M.D. In two volumes—Volume I. including General Medicine, 8vo., 700 pp., fully illustrated; Volume II., General Surgery, 8vo., 670 pp., fully illustrated. Philadelphia, New York, London: W. B. SAUNDERS & Co., 1903. Per volume: Cloth, $3.00 net; Half Morocco, $3.75 net.

No similar publication, to our knowledge, either American or foreign, comes up to this. The matter is carefully selected, edited, and in numerous cases commented upon by the eminent authorities whom Dr. Gould has enlisted as his assistants. Every new theory and scientific discovery worthy of the consideration of the profession has found a place in this unusually complete Year-Book; and the names of the several editors are sufficient guarantee of a proper discrimination. The work comes to us in the same dress as last year—in two volumes. Volume I. contains General Medicine, and Volume II. General Surgery, the volumes being sold separately if desired. As usual, the illustrative feature is well taken care of, there being eleven full-page inserts, besides many excellent text-cuts. We strongly recommend Saunders' American Year-Book as the best work of its kind on the market.

PROGRESSIVE MEDICINE. FIFTH ANNUAL SERIES. VOLUME I., MARCH, 1903.—A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by HOBART AMORY HARE, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. 8vo., handsomely bound in cloth. 450 pp. Illustrated. Per volume, $2.50, by express prepaid. Per annum, in four cloth-bound volumes, $10.00. LEA BROTHERS & Co., Publishers, Philadelphia and New York.

As the title of this publication indicates, its pages are devoted to the real advances of medical science. The editors of its different departments are all scientific men and teachers of experience, and its contents are not mere abstracts of articles appearing in current medical literature, but notable for their completeness. Its sections are so arranged as to cover every branch of professional work without interference or repetition. It is only possible here to direct attention to the more important features in the present issue, although a vast amount of other valuable matter is included.

In the present volume, Frazier, in the section on the Surgery of the Head, Neck and Chest, describes particularly the wonderful progress which has been made in the surgery of the skull and

brain, especially in the diagnosis of brain tumors and abscesses; he also particularizes the latest researches into the surgery of the thyroid gland, and some of the remarkable results achieved in recent operations upon the heart. Herrick writes on the Infectious Diseases, devoting especial attention to the importance of Serum Therapy in the light of recent discoveries. His description of the methods in vogue in the management of typhoid fever and pneumonia is remarkably full and of great value. Crandall, in considering Diseases of Children, describes in detail the methods of feeding and of milk modification, which are of such immense practical value in the prevention of diseases of infancy and childhood. In the section on Pathology, Dr. Hektoen devotes particular attention to the late studies into the specific properties of the various tissues and fluids of the body. A. Logan Turner, in the section on Laryngology and Rhinology, presents a summary of recent achievements in the correction of nasal deformities by means of paraffin injections. Randolph's article on Otology is devoted largely to a discussion of the methods employed in the treatment of various chronic aural conditions, heretofore considered as almost hopeless from a therapeutic standpoint.

The volume is profusely illustrated and completed with an index, which is so arranged as very greatly to enhance its value to the busy practitioner as a work of reference.

DISEASES OF METABOLISM AND NUTRITION.—A Series of Monographs by PROF. DR. CARL VON NOORDEN, Physician-in-Chief to the City Hospital, Frankfort-on-Main. Authorized American Edition. Edited by BOARDMAN REED, M.D., Philadelphia.

PART III.—COLITIS.—This is a masterly treatment of the complex subject of Membranous Catarrh of the Intestines (*Colica Mucosa*). Small 8vo, cloth, 50c. In preparation, "Diabetes," "Acetonuria," and others. E. B. TREAT & Co., Publishers, New York.

"It is due to the disorders of metabolism and nutrition that degenerative changes cut short the activities of so many men and women in middle life,—that, in these latter days, senility and death itself come prematurely to a very large proportion of mankind."

This monograph is in excellent keeping with Parts I. and II. (Obesity and Nephritis), noticed in previous number; an admirable condensation of the best methods of treatment of one of the most prevalent diseases city physicians are called upon to treat.

SEWAGE POLLUTION IN THE METROPOLITAN AREA NEAR NEW YORK, AND ITS EFFECT ON INLAND WATER RESOURCES.—By MARSHALL ORA LEIGHTON. Water Supply and Irrigation Paper No. 72, Department of the Interior, U. S. Geological Survey, Chas. D. Walcott, Director. Washington Government Print.

The present epidemic of typhoid fever in Ithaca should intensify interest in this excellent report of the more or less constant sources of typhoid fever hereabout. It comprehends a terse description, with illustrations, of the sewage-polluted Raritan and Passaic and their tributaries; the Hudson and its tributaries, and damage to water resources of Hudson River System generally, with relation to power, ice, water supplies and realty values.

OPERATIONS OF THE RIVER STATIONS, 1901.—Report of the Division of Hydrography. Part I—East of Mississippi River. By F. H. NEWELL, Hydrographer in Charge. No. 65. *Ibid.* A practical contribution to the availability of water supplies, commended to all State and local health authorities.

BULLETINS, REPRINTS, ETC., RECEIVED.

Cardio-Respiratory Phenomena Revealed by the Röntgen Rays. Albert Abrams, M.D., San Francisco, Cal.

A Modified Method of Auscultatory Percussion. *Ibid.*

Studies in Stethophonometry. *Ibid.*

Use of the Electric Cautery Clamp in the Treatment of Cancer of the Uterus. C. P. Noble, M.D., Philadelphia.

Clinical Report upon Urethral Surgery. *Ibid.*

Use of Concentrated Actinic Sunlight in the Treatment of Tuberculosis. J. W. Kine, M.D., Fort Dodge, Ia.

Does Early Treatment of Acute Inflammation of the Middle Ear Prevent the More Serious Complications? E. L. Meierhof, M.D., New York.

Cancer of the Larynx Cured by X-Rays. W. Scheppegrell, M.D., New Orleans, La.

The Ear, from a Medico-Legal Standpoint. *Ibid.*

Weight and Diet in Pulmonary Tuberculosis. John F. Russell, M.D., New York.

The Microscope in the Diagnosis of Scarlet Fever. W. K. Jaques, M.D., Chicago, Ill.

Cerebro-Spinal Meningitis. John Murdock, M.D., Louisville, Ky.

The Urine from Each Kidney. Fred. C. Valentine, M.D., New York.

Advice to Gonorrhœal Patients. *Ibid.*

The Morning Drop: Its Treatment. *Ibid.*

Examination of a Genito-Urinary Patient by the General Practitioner. *Ibid.*

Hydrated Cyst of the Prostate. L. Bolton Bangs, M.D., New York.

Heredity with a Study of the Statistics of the New York State Hospitals, William C. Evans, M. D., Buffalo, N. Y.

The Rational Treatment of Movable Kidney and Associated Ptoses, A. Ernest Gallant, M. D., New York.

The Methods Which Make for Success in Medicine in the Twentieth Century, T. Gaillard Thomas, New York.

The Differentiation and Diagnosis in Tuberculosis and Phthisis, M. J. Brooks, M. D., New Canaan, Ct.

The Present Status of Homœopathy, James C. Wood, M. D., Cleveland, O.

Yellow Fever Inspection, H. R. Carter, M. D., U. S. M. H. S., Washington, D. C.

Epithelioma of the Clitoris, C. P. Noble, M. D., Philadelphia, Pa.

Drainage versus Radical Operation for Suppuration of the Female Pelvis. Ibid.

Deciduoma Malignum. Ibid.

Report of three rare operations: Hypernephroma of the Kidney—Nephrectomy; Papillary Carcinoma of the Kidney—Nephrectomy; Stone in the Left Ureter—Extraperitoneal Operation, Removal of the Stone. Ibid.

CONTEMPORARY LITERATURE.

MARKS OF CONCRETE PROGRESS IN SOUTHERN EDUCATION.

When Dr. Curry entered on his great educational crusade as agent of the Peabody Fund there was no public school system at all in any State of the South. He lived to see a public school system established in every State. When he began, there was not a legislature in favor of free schools, nor a college or university willing to co-operate. He addressed the legislatures and urged school taxes and appropriations. He opposed the universities and schools in their conservative position. He saw the legislatures, one by one, yield to his arguments; and in due time the colleges and universities became not only reconciled to free public

schools, but began, one after another, to establish departments for the training of public school teachers. The legislatures would have given him almost any political honors; and as for the universities, fourteen of them offered him their presidencies with flattering inducements. He had lived to see wonderful progress, and he had a right to believe in the future.

Dr. Curry had probably a wider acquaintance and a greater personal influence than any other man throughout the entire South. He had rare gifts of eloquence, a broad love of humanity, an unwavering faith in God and country, and a patriotism as fervent as any man could possibly possess. Dr. Curry was, moreover, a great harmonizer. He rose above all sectional feeling, and never ceased to do all in his power to promote good understanding between the North and the South. He appreciated thoroughly the difficulties involved in the Southern race problem, but never ceased to work to make those difficulties less, and to promote the truest interests in both races. Having enjoyed peculiarly agreeable relations with the Government and reigning dynasty of Spain, when Minister at Madrid, he was the man best fitted to be sent to represent the United States at the coronation of the young Spanish king. The mission was a delicate one, in view of the fact that so short a time had elapsed since we had destroyed the Spanish fleets, and stripped Spain of all that was left of her island empire in two hemispheres. President Roosevelt, who appreciated the greatness of Dr. Curry's public services, expressed the keenest pleasure in having the privilege of appointing him as our special ambassador on occasion of the brilliant functions at Madrid, and the selection was well justified. Dr. Curry was treated with greater deference and kindliness than any other of the envoys who represented the sovereigns, courts, and governments of the nations; and thus his brief ceremonial mission to Madrid was of appreciable value in helping to restore friendly feeling between the American and Spanish peoples.—From "The Progress of the World," in the "American Monthly Review of Reviews," for March.

INSTINCT, NOT EDUCATION, TEACHES.

There is a school of the woods, just as much as there is a church of the woods, or a parliament of the woods, or a Society of United Charities of the Woods, and no more; there is nothing in the dealings of animals with their young that in the remotest way suggests human instruction and discipline. The young of all the

wild creatures do instinctively what their parents do and did. They do not have to be taught; they are taught from the jump. The bird sings at the proper age, and builds its nest, and takes its appropriate food, without any hint at all from its parents. The young ducks take to the water when hatched by a hen as readily as when hatched by a duck, and dive and stalk insects, and wash themselves just as their mothers did. Young chickens and young turkeys understand the various calls and signals of their mother the first time they hear or see them. At her alarm note they squat, at her call to food they come, on the first day as on the tenth. The habits of cleanliness of the nestlings are established from the first hour of their lives. When a bird comes to build its first nest and to rear its first brood, it knows how to proceed, as well as it does years later, or as its parents did before it. The fox is afraid of a trap before he has had any experience with it, and the hare thumps upon the ground at the sight of anything strange and unusual, whether its mates be within hearing or not. It is true that the crows and the jays might be called the spies and informers of the woods, and that other creatures seem to understand the meaning of their cries, but who shall presume to say that they have been instructed in this vocation? Mr. Long would have us believe that the crows teach their young to fly. He might as well say that the rooster teaches its young to crow, or that the cock grouse teaches the young males to drum. No bird teaches its young to fly. They fly instinctively when their wings are strong enough.—John Burroughs in the March "Atlantic."

THE CHILD'S HEALTH.

"With the mother more than with any other individual or class of civilization," says Dr. Thomas A. Wood, director of physical training at the New York Teachers' College, "lies the responsibility of the status of our citizens. The foundation of a child's health is yours to lay, long before its birth; and, to a large extent, the superstructure of healthful environment is yours to build. Too often a course in gymnastics or a season or two of calisthenics, undertaken somewhere between the ages of ten and twenty, is considered a substitute for training which should have begun a decade before. Let your child be well born in the vital sense, which, after all, or rather before all, is the physical."

He is not alone in his ideas; there are many thousand women in the National Congress of Mothers, who are doing all they can to develop this and similar ideas among the mothers of this country.

and it is one of their fundamental principles that anything less than perfect symmetry and health in the physical organization promises eventually a moral evil, a crime, which in this day of grace can almost invariably be avoided.—From "Club Women and Club Life," by Helen M. Winslow, April "Delineator."

AN UNMITIGATED EVIL?—SOME OF THE POSSIBILITIES IN AMERICA'S SWELLING TIDE OF IMMIGRATION.

To say that the great bulk of the American people sees in the recent phase of immigration to their country an unmitigated evil is probably not an exaggerated statement. If the reasons for such an opinion were asked, the answer would generally be that the newcomers are ignorant and shabby. For the student of man, however, these reasons have not the weight which they carry in the popular mind. When, as is the case with most of our present immigrants, ignorance has for its cause the lack, not of intelligence, but of the proper educational facilities, it is an acquired negative characteristic. As such it is not transmissible to offspring, and means absolutely nothing for the future of the race. The first Baltic people brought to Rome by the armies of Cæsar were looked upon in contempt by patricians and plebeians alike. They were ignorant, rude, uncivilized. Fifteen centuries later, when the Renaissance swept over their land, the descendants of those same Baltic barbarians started a civilization which, in many respects, is now the first of the world. Placed in the highly favorable American economic conditions, the next generation of our Italian immigrants will promptly show us that they lack neither intelligence nor imagination nor artistic talent. That the recent turn taken by immigration will deeply and in many ways modify our national character is certain. That it will deteriorate it is not. Some of the modifications will be for the worse, some for the better. We can measure the extent of none, and ought thereby to be prevented from making sweeping assertions.

The most conspicuous physical change which will be brought about by intermarriage with the newcomers will be the least noticed by all but ethnologists. It is the change which took place in many parts of Europe after the great prehistoric Alpine invasion, and which is clearly seen in sepulchres posterior to that event. The skull will become shorter and broader. That change is taking place now, on a large scale, in the States of New York, Pennsylvania, and especially Massachusetts. We leave it to esthetes to decide whether it gives us reason to rejoice or lament.—From Gustave Michaud's "What Shall We Be?" in March "Century."

HOUSES SHOULD NOT BE BUILT ON A ROCK.

The parable of the wise man who built his house upon a rock, and of the other man who built on the sands, was uttered before the "house with modern improvements" had made its appearance or modern sanitary science had been evolved. A rock foundation is unimpeachable for stability, but it may be very bad when it comes to a matter of drainage, whether it be for the disposal of sewage or of surface or ground water. A cellar excavated in the rock is usually a wet cellar, because the water leeches through the crevices and seams in the rock, and it is both difficult and expensive to trench and drain properly about the walls of a building in a medium so hard to excavate. To be sure, if the rock drops away quickly on a sharp grade, this difficulty may be altogether a minor one. A good, gravel soil is one of the best to build upon in respect both to drainage and to the stability of the house; and compact sand, if not subject to the action of running water, is a most excellent foundation and a thoroughly good medium.—From "How to Administer a Household," in the March "Cosmopolitan."

CHARMING NEW ORLEANS.

If you should take your map of the United States and run your finger far down its surface until it rested upon the largest city in all the beautiful South, the one which is the second largest export city on the American continent, and the metropolis of a vast inner empire, which holds two civilizations, one French-Spanish, one American, both slowly, very slowly, merging through the centuries; or, better still, if you should stroll along the streets on a sweet March day, peering into its curious quarters, watching the beautiful little children and the dark-eyed men and the gaily dressed women and all the throngs of people, city people who can never long remain away from the green fields and the noble old trees and the scent of the roses—then you could not fail to hit upon this charming old place, New Orleans—in many ways the most interesting of all the cities in America, the beautiful city that lives outdoors.—From "The City that Lives Out of Doors," in March "St. Nicholas."

PRINCIPAL FAIRBAIRN'S SKETCH OF JAMES MARTINEAU,

keen and analytic as it is, may almost be called an "appreciation," so sympathetic is its tone. Readers of all shades of theology will find the article notable and significant. In the same number a charming sketch of the School Colony at Mandres-sur-Vair, sus-

tained by the XIth arrondissement of Paris as a summer resort for its school children, appears in "The Living Age" for February 21, from the pen of Sir Edmund Verney.

PROCTOR'S PLAYHOUSES.

"All work and no play makes Jack a dull boy." Sometimes it is provocation of nervous prostration; but usually the actor stands this strain better than the actress. The case of Miss Florence Reed is an illustrative one. For an entire season Miss Reed, a bright and pretty girl, daughter of the late Roland Reed, whose clever forte for comedy she inherits in a large degree, has worked assiduously in the Proctor stock at the Fifth Avenue. Her piquant manner, her infectious good humor, and her handsome and modish gowning have combined to make her a great favorite with her audiences; but the strain of hard work and constant study have at last told upon her, and news comes that she has succumbed to an attack of nervous prostration, which has forced her, temporarily at least, to take a rest. She is under a physician's care, but is expected to shortly resume her work in better form than ever.

Meanwhile, F. F. Proctor's seven playhouses continue their attractions. The success of "Was It a Dream?" written by Roland B. Molineux, while he was confined in prison, produced by Mr. Proctor at his Twenty-third Street house, New York, has been so successful that he has decided to produce it at his various other houses.

A contract was signed recently whereby Mr. Proctor will shortly give a production to a new English farce, written by a well-known author, and produced for the first time in America by Proctor's Fifth Avenue stock company. The play has had a run of a little over a year in London, and is said to be exceedingly clever.

ANNOUNCEMENTS.

AMERICAN MEDICAL ASSOCIATION, ANNUAL SESSION, NEW ORLEANS, MAY 5-8, 1903.

President, Frank Billings, Illinois; Secretary-Editor, George H. Simmons, Chicago, Ill.; Chairman Committee of Arrangements, Isadore Dyer, 124 Baronne Street, New Orleans, La.

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS, WASHINGTON, D. C., MAY 12-14, 1903.

The following are the names of the Constituent Societies in the

order of date of their organization, and the names and addresses of their respective Secretaries:

AMERICAN OPHTHALMOLOGICAL SOCIETY—Secretary, S. B. St. John, M.D., 68 Pratt St., Hartford, Conn.

AMERICAN OTOLOGICAL SOCIETY—Secretary, Dr. Frederick I. Jack, 215 Beacon St., Boston, Mass.

AMERICAN NEUROLOGICAL ASSOCIATION—Secretary, Graeme M. Hammond, M.D., 60 W. 55th St., New York City.

AMERICAN GYNECOLOGICAL SOCIETY—Secretary, J. Riddle Goffe, M.D., 22 E. 35th St., New York City.

AMERICAN DERMATOLOGICAL ASSOCIATION—Secretary, Charles J. White, M.D., 259 Marlboro St., Boston, Mass.

AMERICAN LARYNGOLOGICAL ASSOCIATION—Secretary, James E. Newcomb, M.D., 118 W. 69th St., New York City.

AMERICAN SURGICAL ASSOCIATION—Secretary, D. P. Allen, M.D., 278 Prospect St., Cleveland, Ohio.

AMERICAN CLIMATOLOGICAL SOCIETY—Secretary, Guy Hinsdale, M.D., 3942 Chestnut St., Philadelphia, Pa.

ASSOCIATION OF AMERICAN PHYSICIANS—Secretary, Henry Hun, M.D., 149 Washington Ave., Albany, N. Y.

AMERICAN ASSOCIATION OF GENITO-URINARY SURGEONS—Secretary, John Vander Poel, M.D., 36 W. 39th St., N. Y. City.

AMERICAN ORTHOPEDIC ASSOCIATION—Secretary, John Ridlon, M.D., 103 State St., Chicago, Ill.

AMERICAN PHYSIOLOGICAL SOCIETY—Secretary, F. S. Lee, M.D., 202 W. 81st St., New York City.

ASSOCIATION OF AMERICAN ANATOMISTS—Secretary, G. C. Huber, M.D., Ann Arbor, Mich.

AMERICAN PEDIATRIC SOCIETY—Secretary, S. S. Adams, M.D., No. 1 Dupont Circle, Washington, D. C.

AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION—Secretary, C. B. Burr, M.D., Flint, Mich.

AMERICAN ASSOCIATION OF PATHOLOGISTS AND BACTERIOLOGISTS—Secretary, H. C. Ernst, 688 Boylston St., Boston, Mass.

The Congress will be opened by the President, WILLIAM W. KEEN, MD., LL.D., at 3 P. M., Tuesday, May 12, in Columbia Theatre, Twelfth and F Streets.

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PREVENTABLE RESPIRATORY DISEASES.*

By J. O. COBB, M.D.,
Surgeon U. S. Public Health and Marine Hospital Service.

SMALLPOX.

This disease has been known from the earliest times. It was known in China several centuries before the Christian era, and the writings upon this terrible scourge are more extensive and voluminous than of any other malady.

From time immemorial man has speculated upon the methods by which this disease is disseminated. He noted that while it spread in warm climates as well as in cold, nevertheless it was a winter and early spring disease rather than one of summer. This observation early led medical men and the laity to believe that it originated from over-crowding. It was also noted that dry weather seemed more favorable to its spread, and that a prolonged wet spell tended to control it in a very perceptible manner.

A careful perusal of the well authenticated outbreaks in comparatively recent years brings to notice the important observation that each epidemic has increased steadily in virulency from November, reaching its highest point in the early part of May, making a sharp decline upon the advent of good weather. It would appear then that the organism of the disease is even controlled by ventilation, for the checking of an epidemic so promptly by the coming of good weather can only be due to the opening up of infected houses, thoroughly ventilating them, and to the fact that the people get out of doors more and are not huddled together so much.

Bacteriology.—At the present date the organism of this disease has not been isolated. That it is caused by a specific organism there can be no reasonable doubt. This is one of the diseases

*Continued from page 310.

that can be introduced by inoculation or by being implanted on the respiratory tract by infected dust. The inoculable form has been known for two centuries. The artificial inhalable method of producing it was known to the Chinese for many centuries, when the dried crusts from cases were used like snuff, as attacks produced in this manner were usually mild.

Contagiousness.—Smallpox is virulently contagious, spreading from person to person rapidly when once it gains entrance to a favorable community. Moore claims that it can be caught from the dead body, from clothing, or most any fomites. However, such instances are rare, and in nearly all cases it will be found that the person contracting the disease has been present in a room previously occupied by a smallpox patient. It seems to be necessary for the atmosphere surrounding the patient to become infected before it is possible for the non-immune to contract the disease.

It is a prevalent belief among the laity and physicians themselves that the extension of the disease from a given focus may be over a considerable distance, even as much as a mile away. Recent clinical experience would tend to prove that with careful isolation and absolute quarantine it will not spread beyond the room in which the case exists. It is easy to convince one's self with clinical experience that it does not fly through the air to any considerable distance, and in looking into the reported cases transmitted great distances, supposedly from a given focus, through the air, it is easy to see the faulty observations and deductions. Without going into details, there is one fact that strongly confirms the contention that it is confined strictly to rooms, and that is, that in opening up the houses in the spring an epidemic is rapidly cut short, while if the contagium were spread by air to great distances, opening closed houses where it had been confined would certainly tend to spread it widely rather than control it.

Incubative Period for Houses and Wards.—It seems that there is a definite time required for it to assert itself in a locality after the initial cases. The Montreal epidemic of 1885 was caused by a Pullman porter from Chicago, who was suffering with the disease, being cared for in a general ward. This was February 28th, and the next case did not occur until April 1st. Shortly after the second case others developed rapidly, and as the second case was a woman who was not treated in that particular ward, it would look as if she had gotten her infection in the laundry, from fomites or some similar way. It is further noticeable in this case

that this female servant of the hospital probably did not come in contact with the patients after she was taken sick, and yet it broke out among them almost immediately upon the appearance of this second case. The most probable explanation is that the contagium introduced by the porter had undergone its necessary incubative period in the ward and that all non-immunes were then infected. It is certain that none of the discharged patients showed any symptoms at the time of leaving the hospital, but many of them developed the disease shortly after returning to their homes, causing many widely scattered foci in the city. A patient is infective from the time his coryza develops until all desquamation disappears. The period at which fomites cease to be dangerous is indefinite, but is probably a year or longer.

Incubative Period.—In the case of the servant girl referred to above, we have a known definite period from February 28th to the date when she got sick on April 1st. This is 31 days, but it is probable that she was not exposed on the first date. For quarantine purposes most authorities are agreed that a period of 21 days is sufficient for detention and observation. The usual clinical period is nine days from date of exposure to appearance of initial symptom.

Complications of the Respiratory Organs.

One of the first things which a patient notices is a sore throat. Acute pharyngitis is nearly invariably present. After the disease is ushered in by chill and fever, the tracheal and bronchial symptoms become marked and are often severe as the disease progresses. Broncho-pneumonia is a common complication, and seems to be the chief factor in the fatal cases of children. The literature covering the necropsic findings in fatal cases is scanty, but it seems that most of them have been caused by pneumonia, diarrhœa and extreme exhaustion. Aside from the very general observation that bronchitis and sore throat are only symptoms, little is said as to lung lesions, except in the later complications. It is possible that the original colony may have grown with a dry field and, the virulency increasing, the colony assumed a fulminant character with development of abundant exudate—the so-called secondary pneumonia, which may have been, after all, a primary infection of the lungs.

Contagiousness.—Some observers claim that the disease cannot be contagious until the eruptive period, and yet there are reported cases that have conveyed it to others without ever having the

skin lesions at all. If smallpox is known to exist and the patient has been exposed and has the other symptoms, even though the eruption has not appeared, it is imperative that all non-immunes be vaccinated and segregated and kept under close observation until the period of 21 days is passed, when there is practically little danger that any person would develop a case after so long a time.

CHICKENPOX.

This disease is very contagious. It usually appears in epidemic form and runs through schools in a few weeks. Its incubative period is about 14 days. Like smallpox, one of the first symptoms is sore throat. The respiratory mucous membranes are inflamed and pustules may appear on them. Ulcerative laryngitis is a very serious complication.

MEASLES.

This is one of the most contagious of the group, and is characterized by a well-marked prodromal stage. The first symptom is the catarrhal condition of the respiratory tract. "Bronchial catarrh is so generally observed that it must be considered to be a symptom rather than a complication" (Williams). Capillary bronchitis and broncho-pneumonia are quite common complications. The latter complication is nearly the sole factor in fatal terminations of measles.

Incubative Period.—The quarantinable period is 18 days, but the clinical is about 10 days. The maximum time after apparent recovery that a patient may convey the disease is usually stated as 21 days. I think this period entirely too short, and that a measles case should not be allowed to return to school for one month after its supposed recovery. Of all this group of diseases this is most distinctly one that grows on the deep portion of the respiratory tract, and so long as the patient has a catarrhal condition with cough, then he is in all probability still capable of conveying the disease to others and infecting his surroundings. The period for infecting the room seems to be very short. The cases are contagious as soon as the cough appears. The complication of broncho-pneumonia makes the case much more contagious and the room in which he is confined exceedingly dangerous.

Chief Sources of Infection.—This very contagious malady runs in epidemics, fluctuating from year to year and from one locality to another. That it ever completely disappears from any large city is improbable. It is peculiarly a disease of young children

in preference to those above 12 years of age. It is very fatal in some epidemics to children under 5 years, principally through the complication of capillary bronchitis. It is spread nearly altogether through schools, some school child usually conveying it into the household, where, through criminal ignorance and barbarous superstition, it is thought by the laity that it is wisest for all the children to have it at once (the younger the better), and be done with it. Measles is more fatal than scarlet fever, causing nearly as great a mortality as diphtheria. Every effort should be made to prevent the spread in schools. It is not a mild disease at all and is quite fatal to young children. The public should be warned of this danger. A bulletin by the Glasgow health authorities is inserted here entire, as the information given is not only good for the laity, but for physicians themselves:

"*Measles is a dangerous disease,* one of the most dangerous with which a child under five years of age can be attacked. It is especially apt to be fatal to teething children. It tends to kill by producing inflammation of the lungs. It prepares the way for consumption. It tends to maim by producing inflammation of the ears and eyes.

"In Glasgow, during the last five years, measles has caused three deaths for every one which has been caused by scarlet fever. Only one infectious disease has been more destructive of life, viz., whooping-cough. Measles has carried off more than four times as many persons as enteric fever.

"It is therefore a great mistake to look upon measles as a trifling disease.

"The older a child is the less likely is it to catch measles; and, if it does, the less likely is it to die.

"If every child could be protected from measles until it had passed its fifth year, the mortality from measles would be enormously decreased.

"It is therefore a great mistake—because, as a rule, children sooner or later have measles—to say "the sooner the better," and to take no means to protect them, or even deliberately to expose them to infection.

"It is wrong for mothers with children in arms to go into houses where measles exists.

"Every child ill of measles ought at once to be put to bed and kept warm. The mildest cases may be made serious by a chill. Measles is, for this reason, most dangerous in winter and spring.

"A case of measles continues infectious for at least three weeks

after the appearance of the rash. During that time separation from the healthy ought to be secured either by removal of the sick to hospital or by isolation at home.

"Isolation means not merely a separate room for the sick, but the withdrawal of apparently healthy children of the same family from school (day and Sunday), and the exclusion of strange children from the house.

"The isolation, as far as possible, from other children of all children belonging to the same family is more necessary in the case of measles than of any other infectious disease, because of this peculiarity—for days before the rash comes out the child is highly infectious.

"School teachers especially ought to be familiar with the appearance of children in this stage of measles.

"The eyes are watery, glistening, and sensitive to light; there is a ringing cough, sneezing, and running from the nose, with a flushed face; in short, all the signs of a bad "cold in the head."

"No child showing these symptoms ought to be allowed to go to school.

"Any child observed at school with these symptoms ought to be sent home at once. Such children are to be looked for more particularly in the Infant Department." (Quoted from Williams.)

In large European cities the fatality from measles is astonishing. It is very fatal in the winter epidemics of over-crowded districts. This, like all the exanthemata, is severest in winter, the mortality and the spread of cases dropping off quite perceptibly on the advent of pleasant summer weather.

There are many reported cases of conveyance by fomites, and it is thought domestic animals may carry it.

Principal Causes of Death.—Broncho-pneumonia, capillary bronchitis and pulmonary suppuration.

GERMAN MEASLES.

This is not so contagious as measles nor so fatal. It is a disease of childhood, but during severe epidemics many grown people suffer with it.

Incubative Period.—The quarantinable period is 21 days and the clinical about 15 days. The period when a case would be free from contagion is, like measles, not until all catarrhal symptoms have subsided.

Complications of the Respiratory Organs.—Nasal, pharyngeal and laryngeal catarrh always present, with more or less redness of

these membranes. Sore throat nearly always present. Bronchitis quite frequent, but pneumonic complications rare.

How Spread.—It spreads rapidly through schools or when children are crowded together.

Principal Causes of Death.—There are very few deaths from the disease, but, when fatal, pneumonia is the cause.

SCARLET FEVER.

This is one of the most puzzling of the exanthemata. It is not so fatal as measles or diphtheria, or even whooping-cough, though an epidemic may become quite severe in its results if unchecked. There has been much speculation over the origin of cases, which are occurring here and there over the entire country and at all times and at any time of the year. It appears in nearly all countries with equal severity, running through epidemics or appearing in sporadic cases. Japan and China have very few cases, though among the foreign settlements the disease has appeared. A strange peculiarity is that it seldom attacks nursing infants.

The Epidemic Season.—It occurs in all seasons of the year, but the greatest proportion of cases occur in autumn and winter. The season has considerable influence on the mortality, the autumn and winter months having the greatest percentage of fatal cases. The summer cases are usually mild.

Bacteriology.—The literature is voluminous with the claims and descriptions of the different organisms thought to be the agents of specificity. It would seem that at the present time the specific organism has not been isolated; or if it be one of the micrococci or streptococci so constantly present in the throat and other organs, then these have become, from some reason, diverted from their original characteristics and have assumed or acquired specificity in a new host, producing, in man, scarlet fever. Such a thing is within the bounds of probability, and Klien's observations relative to a disease affecting cows, and which he claimed attacked man as typical scarlatina, may be true. There have been many outbreaks of the disease in isolated dairying communities, from whence, seemingly, it has spread to those using the milk from these farms. The finding of cases on these farms without means of tracing the source of infection leaves the question in this position: Either it has been introduced on the farm from some person on the outside to one on the inside, and that the premises are infected, thus infecting the milk supply; or the cow has a specific disease, and her milk is infected directly from her, and this be-

comes the medium. In either event the milk is apparently a source of infection. This source of infection seems to be well established, and is strengthened by the clinical observation that nursing infants and the Chinese and Japanese in their Asiatic homes are said to be practically free from the disease. In the one case the explanation would be that the nursing infant, by not using cow's milk, escapes, while it is well known that milk as an article of food is hardly known among the Asiatics. The method, then, of introducing the organism into the body may be by inhalation, by inoculation, by ingesta; by one or all.

Complications of the Respiratory Organs.—The very first symptom, and a constant symptom, is the fiery red throat. The pharynx and adjacent mucous membranes are badly infected from the start. Bronchitis is rare, but there is a dry cough, probably caused by the irritated pharynx.

Contagiousness.—It is very contagious to children and occasionally attacks adults. Very young infants nearly always escape infection. It is the general opinion that it is not contagious until the beginning of the period of eruption, and that a case continues to be dangerous until all signs of the skin lesion have entirely disappeared from all parts of the patient's body. A safe rule of action would be that such cases should be dealt with as infective as long as there is the slightest exfoliation.

Incubative Period for Persons and Houses.—The time is undoubtedly short from exposure to outbreak. In not a few cases it is claimed that the symptoms developed in 24 hours; however, these are rare, and it nearly always develops between the fourth and seventh days. The quarantinable period is certainly as long as there is desquamation, and a child should not be allowed to return to school for one month from the date of complete disappearance of scales. The room becomes infected so soon as the throat symptoms and the eruption appear. If the case is carefully isolated under strict quarantine, the sick-room is the only part of the house to become infected.

Chief Sources of Infection.—Without doubt the disease, in most instances, is communicated from one person to another by the inhalation method. That it is inoculable there can be no doubt. That it may be introduced by ingesta is probable, though the histories of such epidemics do not appear to be reliable in every detail and free from all possible sources of error. If we consider that it is contagious without eruption: is contagious from the appearance of the eruption and before desquamation begins,

it makes one doubt if exfoliative epithelium and infected milk are serious factors at all. It would certainly seem that too much importance has been attached to the desquamative stage and too little to the acme of the catarrhal stage. I am not alone in the belief that the breath of patients suffering from scarlatina is infective. Some cases undoubtedly convey the infection before the eruption appears, whilst there are undoubtedly cases without eruption at all that have communicated it, and this could not have been otherwise than by the person exposed inhaling the minute droplets of infected saliva or mucus in some way driven off in the breath. No one for a moment can believe that the breath itself, the expired and contaminated air, can, merely in passing over a moist colony, pick up bacteria, even the smallest of the micrococci, and waft them along. I do mean to say, though, that quick, short expirations, which are usually accompanied with considerable force, may detach very minute bubbles and particles of mucus, and drive them out into the immediate surroundings. The single act of sneezing would alone infect a room.

All clinical experience is agreed that for direct contagion to take place one must come in close contact with a patient. There are no authentic reports of the disease being conveyed by the air to any distance outside of the room in which the patient is confined. There are numerous instances where children have spoken to other children through windows, across halls, across streets and alleys without contracting the disease. It is thought by some that animal pets may convey the disease, and fomites certainly play a great part in the spread, the observations being that it may be transmitted through the mails merely by paper, or by any object. Old clothes and bedding are said to hold the contagion for months and years, and a lock of hair from a dead relative is said to have caused a fresh outbreak in a distant family. However, all such reports must be looked upon with the greatest suspicion: and if a case is found, the forerunner can usually be located at no great distance. The past careful observations of the most brilliant sanitarians of the world have led us into disastrous conclusions concerning malaria, plague, cholera, etc.—it is now time that we discontinue their methods of building up positive conclusions by the uncertain steps of abstract circumstantial evidence.

Such diseases can be introduced by but three ways, viz.: through the skin or a mucous membrane by inoculation; or by ingestion; or by inhalation, planting the disease at some point on the respiratory mucous membrane. If we keep this well in mind

and make careful note of the pathologic invasion, whereby one disease can be classed as ingestive because of the parts involved, while another is placed under the head of respiratory diseases because of the characteristic lesions, it will aid us much in seeking out the original source of infection. Reasoning from pathological analogy will usually aid us in classing a disease under its proper head, even though its bacteriology remain unknown; applying this method to the disease under discussion makes one nearly ready to drop all speculation and come out strongly for the contention held by many that, given a case, we shall be able to trace it to another, either by direct exposure or to a very recent fomes of respiratory origin and not from exfoliated epithelium or infected milk, the implantation being solely by inhalation.

Principal Causes of Death.—Always we come back to the lungs to find the greatest lesions. The gravest complication in the course of the disease is certainly the severe infection of the kidneys, and still involvement of these organs proves fatal in comparatively few cases. On the postmortem table pneumonias are discovered that have not been suspected in life or only noticed as supervening shortly before death. So even here it is the respiratory involvement that is the usual cause of fatal termination, the next being septicæmia from extensive suppurative lymphadenitis, while the most common of the complications, viz., nephritis, causes little mortality.

RHEUMATIC FEVER.

(Under this head must be classed endocarditis, endarteritis, and the inflammatory affections of the serous membranes, such as pericarditis, meningitis following rheumatic fever, and pleurisies with effusion.)

This is purely an infectious disease of the inhalable variety. That it is due to some specific organism with a short life cycle appears perfectly reasonable to believe. No one, it would seem, could doubt this after watching the onset with its prodroma of *sore throat,* acute coryza, chill, fever and sweating, followed almost immediately by the manifestation of the colonization in one or more of the large joints. The train of complications alone is clinical proof of the fact that the contagium has entered the blood, circulates freely, and affects other serous membranes at great distances away by metastatis. If we take the infection of a knee joint, say, and have other joints or the meninges or serous mem-

branes infected, it is certainly true that these organisms have made the excursion of our circulatory submarine canals and have been washed out on a serous membrane, where they find the exact kind, the exact amount, and the exact bio-thermal conditions to make it possible for them to colonize extensively and survive. I do not mean to apologize at every step for the position that is assumed, viz.: that the entrance of bacteria into the circulatory medium is an easy and common occurrence, for we have so many clinical evidences of this fact occurring daily to the general practitioner, and especially to the surgeon, that it seems unnecessary to point them out. How often have we patients with swollen and red and distended knee joints that give history of a recent contusion by falling, or striking against a sharp object, or in a "mix-up" in a football game! You pass in your sterile aspirating needle, withdraw a turbid fluid, mount and stain it, and find under the microscope the pus-producing organism. You have a typical joint-abscess which, if treated as such promptly, gives a good result. Now, whence comes the infection? And why? And how?

Rheumatism is selective for the very young adult. One attack predisposes to others, and the rheumatic often changes to the gouty diathesis.

The Season of Attack.—Most cases occur in winter, but that exposure to cold, as such *per se,* can only have an indirect bearing, is assured. A period of experience covering five years in an excessively wet and cold climate convinces me that this is a factor in reducing the number of cases rather than causing them. Dry winters, rather than wet winters, have the greater number of cases, though this statement is made with the reservation that it is only a personal observation.

Bacteriology.—All attempts to isolate a specific organism which would meet the requirements of specificity have been futile. That the disease has probably never been induced in animals need not for a moment be considered, for neither have we induced scarlet fever, nor mumps, nor measles, nor whooping-cough, and yet there are certainly few with the temerity to deny the specificity of these diseases.

It is believed to be an inhalable disease only, the primary colony probably being somewhere on the respiratory tract, growing in nearly invisible colonies in unfavorable soil, while the organism gaining the circulation drifts along until washed out on a serous membrane—on favorable soil for permanent colonization. What-

ever may be the specific organism, it is more than likely closely allied or related to the organism of scarlatina.

Complications of the Respiratory Tract.—My experience has been that all these cases give a history of acute coryza and sore throat, and nearly always *tonsillitis.*

Chief Sources of Infection.—That it is introduced by infected dust there is little reasonable doubt. The nature of the specific organism is entirely unknown, and it can only be surmised that it may be a parasite whose habitat is the mucous membranes of the respiratory tract of man or animal, and being driven off and becoming dry, is inhaled and planted under different conditions. Endocarditis, pericarditis, etc., are probably diseases caused by the same organism and induced in the same manner.

MUMPS.

This disease has such marked pathological lesions that it is not easily mistaken for any other affection. It is one of the earliest to be described and the one known least about. Being a typical glandular disease, and, too, selecting for site a particular functional gland for colonization, has naturally befogged one's ideas and led us off from logical conclusions. Just because the gland affected opens into the mouth by a duct, and that the mouth of this duct often shows signs of inflammatory reaction, causes us naturally to jump to the conclusion that the method of infection is from the mouth through the duct. This was not controverted until several cases were reported by reliable observers where the first demonstrable lesions were undoubtedly in the testicle and mammæ, without parotitis, or with delayed involvement of that gland. And then there came forward those who claimed that it was communicable from the breath of the patient, and that there were known cases contracted from patients before there was any glandular implication at all. It is further claimed that it is very contagious in all its stages, and especially so just before the gland symptoms develop. It runs rapidly through schools. Small children are not so susceptible as those over ten years. The most susceptible age is between ten and twenty.

The Epidemic Season.—The school season is the mumps season. Whenever introduced into a school, it usually attacks most of the pupils in rapid succession, regardless of the season.

Bacteriology.—Mumps is an inhalable disease, and probably not one introduced through the mouth. Careful study of an epidemic and watching the rapid spread from one to another is convincing

that the organism of this disease is growing somewhere on a respiratory mucous membrane, and that the contagion is set free by means of the small droplets or small bubbles of infected mucus. It is acknowledged that it sometimes manifests itself only by an orchitis; and it is further acknowledged that such cases may and do convey the contagium. Here we surely have an invisible colony in the lungs or in the throat, or both. If the organism only reached the outside, through the mouth from the duct, the contagiousness would be materially reduced.

Complications of the Respiratory Tract.—Comby is quoted as authority for the statement that the initial symptoms are sore throat and fever. Pharyngitis is a frequent complication, as is broncho-pneumonia.

Contagiousness.—The disease is contagious immediately after the appearance of the initial symptoms and continues to be so throughout its course. It may be contagious for months. A child should not return to school for a month after supposed recovery. Just because it is so seldom fatal is not and cannot be an excuse for carelessness and indifference to its spread.

Incubative Period for Persons and Houses.—The clinical period is twenty-one days, but the quarantinable should be a week longer. The patient's immediate surroundings are certainly infective from the start.

Chief Sources of Infection.—From person to person and by infecting the room. It is very doubtful if the disease is conveyed by fomites.

WHOOPING-COUGH.

This disease is one peculiar to childhood, but adults may contract it. It is more fatal than scarlet fever, and in overcrowded districts is quite a dangerous malady.

The Epidemic Season.—Usually in the spring months there are more cases, but it occurs at all seasons.

Bacteriology.—This certainly is an inhalable disease. The organism seems to colonize on the entire respiratory tract. The bacillus described by Koplik is probably the specific organism.

Contagiousness.—So soon as there is cough there is possibility of infection, and this continues for days, weeks or months, until the patient is entirely well.

Incubative Period for Persons and Houses.—The clinical period is about nine days, and the quarantinable twenty-one. The room becomes infected immediately upon the commencement of the cough.

Chief Sources of Infection.—It spreads rapidly in schools. The school-rooms become infected. The life of the organism seems to be short, and it probably does not long survive in clothing. It seems to be a contact disease.

Principal Causes of Death.—Broncho-pneumonia, capillary bronchitis and exhaustion from cough. The disease kills ten thousand children every year.

DIPHTHERIA.

This disease killed 16,475 persons in 1900. It is gratifying to note the great annual saving of life that has come about in a decade. The percentage reduction is 34.7 in every 100,000 of population. The general use of antitoxin has brought about this wonderful decrease in this fearful malady of childhood. It has not only reduced mortality, but cutting short the attack, has hastened recovery, prevented chronic cases, which are such a great source of infection, and by these means aided in the prevention of the spread. There is one phase of the question that we must not overlook in the joy over such a grand scientific triumph, and that is, we must not become indifferent to quarantine and disinfection—we must and can prevent the infection from traveling from one person to another, from one school to another, from one house to another. Failing that, then antitoxin will again come to our aid. We must not depend alone on antitoxin.

The Epidemic Season.—This is certainly a winter disease. In winter we have worse epidemics, worse cases, and a greater number of fatalities.

Bacteriology.—The Klebs-Loeffler bacillus is the organism of specificity. It is implanted by inhalation and by inoculation. It grows most rapidly on the respiratory mucous membranes, but extends to all the mucous membranes, producing its characteristic colonization.

Contagiousness.—It is infective from the very first redness on the respiratory mucous membrane to the entire clinical disappearance of colonization. It can be infective even after this, for bacilli growing in the tonsil crypts or nasal fossæ, which have lost their virulency to the patient because of his recent immunization, may, however, retain their specificity and cause the disease if introduced in others. A child should not return to school for *two* months after being reported clinically cured by his medical attendant.

Incubative Period for Persons and Houses.—The first symptoms usually show up in two days after exposure. The quarantinable period is 14 days. The patient infects his room immediately upon the appearance of the initial lesion on the mucous membrane. The room or school-room will remain infected for many months, unless thoroughly disinfected.

Chief Sources of Infection.—It is conveyed from one person to another by the infected atmosphere, infected dust, by inoculation, and by implantation by children putting their infected fingers into their eyes, nostrils or mouths. It is undoubtedly conveyed by fomites. The chronic cases with colonies in the nasal fossæ or crypts in the tonsils are virulent to non-immunes, and many supposed infections from fomites are most likely from the latter source. Adults and immunes who come in contact with the contagium may convey virulent bacilli in this manner, viz.: on their mucous membranes, thus infecting others and their own immediate surroundings. If the bacillus may grow and survive on the mucous membranes of adults and immunes as a saprophyte or mucous membrane parasite, capable of becoming pathogenic when implanted on favorable soil, it is certainly possible that it may grow and survive on the respiratory tract of domesticated animals and be carried from house to house in this manner. I cannot see that it is necessary to demonstrate the lesion in animals to believe this when we have the point so forcibly illustrated in man. Physicians may convey the disease in this way in their throats or nasal secretion.

Principal Causes of Death.—Pneumonia, membranous laryngitis, suffocative bronchitis caused by plugs of membrane, and paralysis of the heart due to absorption of ptomaines.

TYPHUS FEVER.

This disease is very rare in this country and in most of the great centres of population in Europe, though there are occasional outbreaks here and there in large cities. Owing to the very strict quarantine regulations of this and the Canadian governments it is seldom imported, and even when introduced is quickly stamped out by a thorough disinfection and isolation. It is epidemic in certain towns in Ireland, Mexico, Russia, India, and Egypt. The U. S. Public Health Service is kept constantly vigilant to prevent its introduction by old rags from certain ports in the Old World and Mexico, which are seldom free of infection. There is no excuse for its existence at all. It is easily recognized;

easily quarantined; easily controlled; easily disinfected. It is a filth disease, essentially, therefore a disgraceful disease.

Epidemic Season.—It is a disease which is most virulent when the poor are crowded together, this, of course, being the bad weather of winter. Liceaga calls attention to the fact that the epidemic of Mexico increases in winter and during the dry season, and declines as the rainy season comes on.

Bacteriology.—So far it is not positively known whether the organism has been isolated or not. It is distinctly an inhalable disease.

Chief Sources of Infection.—From one person to another by inhalation solely, or by inhalation of infected dust from a room or house which has previously harbored a person sick with typhus, or by inhaling the infection from fomites. There are many well established histories of the infection being introduced into one locality from another; from one city to another; from one country to another; across rivers and over seas and oceans by means of infected rags. The intercommunication between the United States and Mexico is constant, but owing to the efficiency of the Sanitary Inspectors of the U. S. Public Health and Marine Hospital Service, no cases have been introduced across our line by fomites. So far as I have been able to ascertain, the disease has not passed the seaport quarantine of this country at any port over which the Government has control. Our Canadian cousins, with their very efficient quarantine service, have done quite as well. Mexico has the disease endemic, and it is very hard to eradicate it completely, in spite of an efficient public health service that is a credit to that country.

Principal Causes of Death.—With the very able and abundant literature upon this disease, the necropsic findings are barely mentioned, and one fails to find the real cause of death mentioned. The blood, of course, shows marked change, the engorgement of the liver, spleen, and venous system being very marked. Several writers mention, though merely incidentally and as a casual observation to be noted, that there is pneumonia—secondary pneumonia, or pneumonia supervening during the illness. That there is constant congestion of the lungs is probable.

INFLUENZA.

Of all the contagious diseases this can travel faster and reach more people of all walks of life in a given time than all the others put together. It travels in insidious ways and by divers routes,

and yet man is the immediate and remote host. It is probably not a saprophyte, as its life cycle is short and its cultivation extremely difficult. It survives for short periods outside of the body, in dust, or in any accidental medium.

The Epidemic Season.—It does exist in warm weather, but not extensively. In pandemics, season does not seem to affect its progress materially. The sporadic cases following in the wake of a big epidemic usually occur in winter.

Bacteriology.—This is purely an inhalable disease. The organism of specificity is Pfeiffer's small bacillus, which was isolated in 1892. The bacillus grows reluctantly on artificial media, and probably not at all on accidental media, such as soil, etc. It survives but a few days when desiccated. It seems to require for its propagation implantation on the respiratory mucous membrane, and by preference the bronchial. (Finkler.)

Complications of the Respiratory Organs.—The entire respiratory tract is often involved. There are cases where pneumonia is the first symptom, this condition being called erysipelas of the lungs by Finkler, but as a rule the implantation is in the upper tract and extends to the bronchi and lungs by continuity.

Incubative Period for Persons and Houses.—The clinical period is usually three days. The surroundings of the patient—the room, the theatre, the carriage, or the car—are infected from the start and continue so as long as he occupies them and for a considerable time afterward. The disease may become latent and still be infective for months after.

Chief Sources of Infection.—There is cough from the start. The first symptoms may be coryza and sneezing, which would certainly spray out hundreds of little droplets, infective air bubbles that float about for a considerable time. If one will sneeze across a ray of sunshine he will be astonished to note the many little balloons he has set sailing up and down with the air currents of the room. These can be seen with the unaided eye, and what this field would reveal under the microscope can only be surmised. The mere act of talking must drive off these little particles of mucus or saliva. During an epidemic a very few persons in the acute stage would suffice to infect a whole theatre of people in one evening, and it only takes a little flexibility of the imagination to see how the disease may spread in churches, in schools, in street-cars —everywhere. It is a dangerous disease, which leaves a blackened trail of secondary sicknesses and ills not always attributed or attributable to the original attack. Its effect on the mortality

statistics is marked, especially on the reports of pneumonia. It is more than likely that many pneumonias following "a bad cold" are influenza pneumonias, rather than lobar pneumonia due to the pneumococcus, which has a sudden onset.

Principal Causes of Death.—Pneumonia in adults and capillary bronchitis in children.

TUBERCULOSIS.

This disease kills a hundred thousand people in the United States every year. There is no way of procuring even the approximate number of the new and standing cases each year. That three hundred thousand is a low estimate is more than likely. The mortality from tuberculosis for the five great nations of Europe alone gives us half a million, and surely the other nations of the world will complete the figures for a million deaths each and every year from a partially, to say the least, preventable disease. The loss of men in our great wars, with the havoc of fighting and shooting and maiming: yes, and all the sickness caused thereby, do not begin to compare in fatal results with this one disease. It is so constantly among us that we have become accustomed to its presence, and thereby indifferent to its insidiousness. We actually treat a death from tuberculosis as we do one from old age—as if it were entirely unavoidable. This phase of the subject has been gone into by so many faithful and brilliant workers that I would pass it by with the strong assertion and contention that it is a preventable disease, and that its frightful ravages in this age of enlightenment is a standing disgrace to the world.

The material mind cannot, as a rule, reason or calculate beyond the realm of dollars, and even so, if one be given to statistics, or interested in complex or abstract speculation, on the remote effects of sickness and death upon the earning capacity of the body politic, he is urged to grapple with the stupendous problem of the losses caused or gains not accomplished through the sinuous windings of this slayer of man.

No one will question that the method of infection is by inhalation, by inoculation, and that sometimes it is by ingesta. However, in man it grows best deep down in the tissues of the lungs. The bacilli penetrate the air vesicle, enter the underlying intercellular tissue, and reach the lymph or blood capillaries, or, if arrested, form tubercles. If they reach the lymphatic glands they are probably destroyed, if in small numbers. This, like all such infections, depends much upon the numerical invasion as to

whether the attack is severe or mild, or at all. This bacillus probably does not grow in the air cell with mucus as the medium, but in the lymphatics and underlying areolar tissue. Usually the first arrest of bacilli is in the bronchial glands. "Pizzini inoculated lymph glands from forty people who had died of accident or acute disease, into guinea pigs. From the results of the inoculation experiments he concluded that forty-two per cent. of healthy people have tubercle bacilli in their glands, mostly in the bronchial. Statistics of the Paris morgue show that a considerable proportion of all who die of accident or suicide have evidences of some tuberculous disease in connection with the respiratory system." (Lartigau.)

This observation would lead one to believe that the bronchial glands are combating the constant invasion of small numbers of bacilli more or less successfully. Theobald Smith pointed out several years ago that in certain necropsic findings in bovines, widely separated infected areas appeared to be more recent than others, some of these foci showing undoubted recent infection, while many were in different degrees of healing. If the contagium is widely disseminated, as it seems it is, then it is highly probable that bacilli enter our air vesicles more or less constantly, and having entered the air sac, they are either devoured by phagocytes or they penetrate the walls of the vesicle, and enter the lymph capillaries or blood vessels and circulate as simple foreign bodies, doing no harm whatsoever, unless that mysterious condition which we call susceptibility supervenes or exists, when we have the disease produced in all its classic pathologic phenomena.

When the invasion is by inoculation it is usually mild and confined to lesions of the skin, with slight systemic disturbances.

That it is seldom introduced by ingesta seems to be capable of demonstration from the simple clinical observation that fatal cases with known virulent bacilli so seldom show evidences on the post-mortem table of intestinal or mesenteric infection, notwithstanding we are perfectly certain that these fatal cases have swallowed great quantities of sputum, before meals, after meals—at all times of the day. That there should be so few secondary infections of the bowels from primary infection of the lungs is queer, and one of the hardest problems to solve, and it would seem one of the hardest for Ravenel and Salmon to controvert.

Another side of the controversy has been overlooked, and it is that, if man be infected from milk, bacilli must penetrate the intestinal mucous membranes and reach the circulation as simple

foreign bodies without lesion in the abdomen, as the primary colonization is in the lungs. There is not the slightest doubt that they can and do penetrate the intestinal mucous membrane and reach the lymphatics below without demonstrable lesion of any kind, and if we will only keep in mind that bacilli may enter the blood vessels and circulate as simple foreign bodies, doing no harm at all until arrested, we can then comprehend that the infection could be by ingesta, as Ravenel claims. If we will go further and look into the histology of the lung tissue, and especially of the terminal arteries, the method by which bacilli and such foreign bodies are screened out of the circulation and cared for by the pulmonary glands and lymphatics will be readily understood. As Hutchinson and Theobald Smith have said, wherever and however introduced, tubercle bacilli sooner or later show up in the lungs. All of us must have noted that in intraperitoneal injection of bacilli into guinea-pigs, quite often the lung lesions show the first colonization, and with intravenous injection this is nearly always the case.

It certainly requires tremendous and constant dosage to infect man if milk be the medium. All observation goes to show that the intestinal tract of the mammalia is decidedly refractory to the bacillus (or, in fact, to any disease) when introduced by food or drink. This is true to a certain extent even of the most susceptible animal, the guinea-pig, for to infect him with any regularity and certainty by this means, the dosage must be constant and powerful. The intestinal tract of man is nearly immune to infection from the constant dosage of virulent sputum from his own lungs, and there appears no good reason then to believe that the bovine bacillus will attack us more readily than our own human bacillus. Minute dosage of bacilli injected into the peritoneal cavity reach the same set of lymphatics and glands as bacilli would if entering from the intestine, and yet with the injection method we invariably produce fatal tuberculosis.

If it be true that bacilli do penetrate the intestinal tract and enter the circulation, to be screened out in the lungs, the reasons for this strange action would be that they did not meet the nutritive conditions elsewhere, and it is necessary for a bacillus to be arrested to cause chemotaxis and produce a lesion. Before this time it acts as a simple foreign body, and we must admit that bacilli may penetrate the intestinal or respiratory mucous membranes without necessarily becoming arrested, for the reasons previously stated. However, feeding experiments of guinea-pigs and

swine usually show the first signs of invasion in the abdominal organs. Then granting that the infection of man is commonly by ingesta, as Ravenel claims, and admitting that the colonization would be in the lungs, even though introduced through the intestinal tract or tonsils, we nevertheless come back to the first steps of the investigation and ask, Whence comes the infection of the cow? She has clean food, clean hay, clean bran. She is not a feeder on milk. When we find out how the cow is infected, then, and not till then, can we hope to work out the infection of man.

The assumption is, then, that nearly all human tuberculosis is contracted by the method of inhalation. Whether one case is infected directly from another in an endless chain, or whether the contagium is universal, and it becomes infective because of lowered vitality incident to life in squalor and overcrowding, does not alter the question. It would appear that there is some other agency at work besides sputum in the spread of bovine tuberculosis, since it cannot be from human sputum, for Theobald Smith has demonstrated to our satisfaction that bovines are with *difficulty* infected by inoculation from human bacilli. That there may also be some other method of spreading it to man than by human sputum furnishes us an attractive speculation.

But it is well to state here that one's belief in Smith's and Koch's investigations must be limited, because neither of them has carried these experiments as far as he should. Each acknowledges that human bacilli caused limited local infection in bovines, and we cannot feel perfectly safe over this until recovered bacilli from such cases are carried on through other bovines to see if a typical bovine virulence and specificity can be established. Salmon and Ravenel have summed up enough evidence to make it necessary for caution, especially since the matter involves the commercial side to such a great extent. The question, after all, as to difference, may be one of exact bio-thermal condition, which might cause one or the other to become specific to a different species where there was constant exposure. We know that the cow's normal temperature is considerably higher than man's. And this calls to mind that Nocard implanted into the abdominal cavities of fowls human tubercle bacilli imprisoned in collodion capsules, and thus converted the specificity of the human tubercle bacillus to that of the avian tubercle bacillus. There have been other experiments somewhat similar to this, with practically the same results.

I cannot but believe it probable that a child constantly dosed

with tuberculous milk may eventually become tuberculous. I also believe that constant intravenous injection of large amounts of human tubercle bacilli will finally give the cow general tuberculosis. Taking these bacilli, the human, bovine and avian, that produce nearly identical lesions, it seems reasonable to believe that here the differences in their individual specificity must have been brought about principally by the element of nutrition and cellular heat in the animal species attacked. In this instance one must not lose sight of this most important fact, that although human and bovine bacilli are similar, generically and otherwise, nevertheless one chooses man as its host and will not develop readily in cattle as a fatal disease, and the other chooses cattle as its host and will probably not grow in man. And keeping in mind the inherent characteristics of these two bacilli, we are certain that while each possesses a certain character and specificity of its own, it will not grow when planted until it finds the exact kind, the exact amount of nutritive medium under exact and necessary bio-thermal conditions. And to make it still plainer, one can understand that if it be a fact that the two bacilli are different in the matter of specificity, the human bacillus entering the cow's lungs, as it certainly must, acts merely as a harmless foreign body. The converse of this is probably true of the bovine bacillus in its relation to man. There must be not only susceptibility of the animal, but the necessary virulency of the micro-organism itself. And this virulency may be re-established in an attenuated or diverted tubercle bacillus by a given and constant numerical dosage.

PLAGUE.

This disease is very dangerous to tamper with, and once introduced into a thickly-settled and overcrowded community, it is extremely hard to eradicate. Sporadic cases are continually cropping up after it is thought the focus or foci have been wiped out, and these cases, if not promptly controlled by wise measures, may eventually, and when least expected, lead to a disastrous epidemic. These intermittent and sporadic cases are usually of the glandular type; and while they may be, and usually are, extremely fatal, it nevertheless seems that they are not so contagious. To become disastrous as an epidemic it is necessary to have numerous cases of the pneumonic form, which will readily and rapidly infect houses, rooms and localities. It is essentially a filth disease.

Epidemic Season.—A severe epidemic will spread at any time of the year, and is apparently not influenced by climates or seasons.

Bacteriology.—Kitasato's bacillus is the organism of plague. It is frequently introduced by inoculation, by food and drink, and is extremely dangerous and fatal if it is inhaled and colonizes in the lungs.

Incubative Period for Persons and Houses.—Kitasato gives the period between two and seven days. The quarantinable period is 21 days. A suppurating bubo or delayed recovery of the pneumonic form may retain the infective organism for weeks and months. A room or house or old clothing or bedding retains the living organism for months. On artificial media the organism is attenuated, but its virulency may be revived by passage through a susceptible animal. The bacillus growing under saprophytic conditions, in sewerage, swill, stagnant water, etc., probably soon becomes so attenuated that its virulency is lost; not so, however, if it remains in a dry condition. Here, if introduced again into the animal organism, it will produce the disease.

Chief Sources of Infection.—There is still much speculation over the method by which it is spread. It is clearly inoculable and it can be induced by feeding, but whether it is inhalable is still undetermined. Reasoning from analogy and from the rapid spread and severe contagiousness of the pneumonic form, favors the belief that it is principally inhalable. Because a disease may have marked pulmonary, or cerebral, or liver, or spleen infections, need not of necessity mean that the primary colonization was in one or the other organ. However introduced, this organism is selective for the glandular tissue and the lungs, and this selective peculiarity exists whether the lesion be primary in the lung or glands. Just because it may elect to grow in the glands is no argument, because mumps grows in the parotid. However introduced, glanders shows up in the lungs, and feeding experiments with animals in plague show that *it kills in the same way as when inoculated.* (Kitasato.) If the disease is spread by inoculation through abrasions of the lower extremity, it would seem to have a limited field and be easy to control. It is positively known that a wound can become infected, but still it would appear not to be communicated in this manner to any great extent.

The characteristics of this bacillus long ago suggested the hunt for a host in one or several of the human or animal parasites. As an epidemic in man was usually preceded by a great fatality among rats from this disease, it was thought that the flea infesting rats might be the host and conveyor to man. All the work of this

nature has been discredited by citing the fact that the species of flea infesting rats will not bite man, though it would not be at all surprising to find that after all the flea is the intermediate host, and that the species commonly infesting rats become infected and may occasionally bite man. If this is the case, it more than likely gives us the glandular variety, while the pneumonic is contracted by inhalation. The investigations that have been made, and those that are being performed, leave the subject still unsettled.

The pneumonic, which is the dangerous form, is in all probability spread through the inhalation of dried sputum from pneumonic cases or desiccated rats. An epidemic never really becomes severe until the lung cases begin to crop up, and then it spreads rapidly with great fatality. In some epidemics almost the first cases have been pneumonic. The explanation for this is probably in the fact that it has previously existed among rats, and their decaying bodies have infected their surroundings.

The disease may be conveyed by old clothes, bedding or any article of furniture or wearing apparel. It survives for long periods of time in fomites.

Principal Causes of Death.—Pneumonia and septicæmia.

CEREBRO-SPINAL MENINGITIS.

There has been much discussion over the cause of this disease. It seems to never entirely die out in certain sections, sporadic cases occurring in all countries at various times. There have been many severe epidemics, and the fatalities have been as high as 75 per cent. in some of them. Few of those attacked entirely regain perfect health. It occurs more often with troops, and is usually circumscribed in certain localities.

Epidemic Season.—Very few epidemics have extended into the summer. The curve begins to rise in December, reaching its highest point in March, declining rapidly upon the advent of summer.

Bacteriology.—The diplococcus intracellularis is the organism of specificity in the epidemic form of cerebo-spinal meningitis.

That the pneumococcus causes a severe and fatal meningitis, and that this organism is very often found in the meninges, is undoubtedly true. The great similarity of morphology need not of necessity strengthen Netter's contention. We know that the pneumococcus growing in the lungs produces abundant exudate, but while growing on serous membranes it produces little, therefore his contention that the pneumococcus is the cause of epidemic

meningitis does not seem to be well grounded, because, if for no other reason, we have no clinical evidence that lobar pneumonia can be diverted into epidemic cerebro-spinal meningitis; and another very strong reason is the fact that however severe the pneumonic infection and its complications (such as meningitis) may be, it runs its course, whether fatal, severe or mild, without the skin lesions so characteristic of spotted fever. It would certainly be likely that if the pneumococcus were the organism of specificity in *epidemic* meningitis, that this same organism, which is so constantly present from the great number of cases of pneumonia, would certainly be the cause of numberless outbreaks of cerebro-spinal meningitis. And furthermore, when we have the cerebral complication following a lobar pneumonia, it is noticed that this meningitis does not create the havoc with the nervous system as does the epidemic form.

Complications of Respiratory Tract.—Whether the pneumococcus or the diplococcus intracellularis is the cause, there is constant lesion on the respiratory tract—usually the nasal fossæ and the lungs. Pneumonia and bronchitis are frequent complications —nearly constantly so. Writers have attempted to prove that the point of entrance of the organism was by the anastomotic lymphatic circulation through the cribriform plate of the ethmoid. This seems dragging anatomy to a fine point, and one is ready to question this claim, since we find that they illustrate this as the point of entrance also of the tubercle bacillus in tubercular meningitis. It has been pointed out time and time again that the tubercle bacillus could certainly reach the circulation from any portion of the respiratory tract easier than it could reach the meninges through these lymph radicals. Furthermore, if we call anatomy to our aid, it should be used correctly. We know that the lymph radicles passing through the cribriform plate drain the dura and not the pia, nor the arachnoid. Bacteria do not travel up stream, anyway. Why should there be such ingenious arguments to show this minute point of entry when we are so certain that the organism of scarlatina, diphtheria, anthrax and its spores, pus organisms, etc., do reach the circulation through the respiratory mucous membrane?

It will be necessary here to recall to mind what was mentioned in the first part of this paper in reference to this very point, viz., that putrefactive bacilli must be constantly in our blood and making the rounds of our circulatory apparatus without apparent harm to us or injury to their own life cycle. We are not even able

to discover them until the organ has been functionally dead for some time, when they become demonstrable as large organisms, immediately upon the commencement of putrefactive changes. They are anaerobic and require certain exact bio-chemic and bio-thermic conditions for their growth. Then if these organisms are constantly entering our circulation, why should we be so anxious to try to prove that the entrance of the diplococcus is through the cribriform openings? And furthermore, if the organisms enter here and colonize only on the meninges, how shall we explain the modus operandi of infection to another person?

Contagiousness.—It is contagious from the onset and may continue so for months. It is contagious to all ages and all classes of society.

Incubative Period for Persons and Houses.—It is not known how many days it is after exposure before it manifests itself. There are no prodromal symptoms. Most writers agree that the contagium survives for long periods in infected houses or barracks.

Chief Sources of Infection.—The contagium is most likely introduced by inhaling infected dust. It is the general opinion that it can be conveyed by fomites. Barracks that have been abandoned for considerable periods of time have proved infective upon the entrance of other troops. It is an infectious disease, and ascribing its causation to dampness or other climatic influences seems to deserve no consideration.

(*To be concluded in the next number.*)

HYGIENE OF THE TROLLEY PARK AND THE PICNIC GROVE.

By HARVEY B. BASHORE, M.D.

Great assemblages of people for any length of time are more or less fraught with danger to health. The Greeks before Troy experienced it; the citizen soldiers in the home camps, even on the hills of the wild and beautiful Susquehanna, experienced it, and though thirty centuries separate the one from the other, the story is much the same.

The assemblages of the army camp are giving place gradually to the peaceful ones of the trolley park and picnic grove, and the question has been raised whether or not these gatherings do not

contain some of the elements of danger that have been and still are incident to camp life.

In these picnic camps people come and go, yet there is practically continuous habitation for three months at least, and unless we use the precautions that are everywhere recognized as necessary for such cases, it is likely that we shall find these parks to be a factor in the public health.

First in importance is the disposal of human excreta, for which, screened from public view as far as practicably consistent with convenience, is a dry, asphalt-coated or cemented pit, in which the deposits are covered with earth every evening, and finally emptied on cultivated land at the end of the season, or oftener, if necessary. This pit should be enclosed by a carefully constructed privy house, and a ventilating shaft of not less than eight inches in diameter, extending from the pit on the outside of the house to at least fifteen feet above the roof. Both the pit (outside) and the seats in the house should be provided with lids to exclude flies.

At a certain picnic grove which I visited last year the closet accommodations illustrated both the good and bad phase. One was in a dark, secluded spot, and there were no flies and no odor save that of chloride of lime. The other overhung a small stream which flows through the grove, and was filthy in the extreme; piles of fecal matter lay exposed to view and myriads of flies were feeding thereon, and then flying, perhaps, to the nearest eating stall. There was a urinous odor fifty feet away, and there was no more privacy than in the "Midway" shows of the Pan-American. No one can deny that such a place is likely to become a disease-spreading focus, especially since there are times when as many as 100,000 people visit this place in one week.

We now know that flies sometimes carry disease germs, and for that reason all foods and all eating stalls should be properly screened; probably the protection to food afforded by glass cases and refrigerators is the only right way, for the little fruit flies—and these are the ones, perhaps, most likely to need watching in camps—will readily crawl through the meshes of ordinary screens.

The water supply of picnic groves is usually pretty fair, for the springs and streams supplying them are generally drawn from a wild and virgin upland. The water, however, should be examined from time to time by an expert, especially during the "season," and all the precautions taken which are so well known and recommended for public supplies elsewhere.

Dust is another element to be considered, not only on account

of its unpleasantness, but as a dangerous element in carrying certain spores, especially those of tuberculosis. Dust can be so readily kept down by sprinkling, and at so little expense, that we have a right to demand its elimination.

There are certain poisonous weeds which should be destroyed in public parks, poison ivy, of course, ranking first in the Eastern States. I have seen a poison-ivy dermatitis cause as much trouble as many a case of erysipelas, and the person who gets such a dose is not likely to revisit the same spot very soon again.

Ragweed, as being one of the great exciters in hay fever, should be eliminated, for those who are susceptible to it generally make special endeavor to avoid localities containing it.

There should be plenty of seats in the grove, and there should be adequate protection against storm; wet clothes, followed by a ride in an open trolley car, has sent many a person to bed with a serious illness.

Finally, there should be thorough policing, at least for the sake of the children, for the profanity and the uncouth manners of the rowdy and the drunkard strike deep in the fibres of the receptive child.

West Fairview, Pa., April 6, 1903.

GERMAN PLAN FOR GUARANTEEING FRESH EGGS.—Consul J. I. Brittain writes from Kehl, January 15, 1903:

A unique method for insuring the freshness of eggs has been adopted by the Dairymen's Association in the vicinity of the city of Kehl. The agents of this association go among the farmers each day and purchase eggs, the farmer guaranteeing that these have been laid within the previous twenty-four hours. In consequence of this guaranty, the association pays the farmer 3 pfennigs, or about half a cent, above the regular market price for each egg. The Dairymen's Association then makes a record of each purchase by giving the farmer a registered number and numbering each egg in a corresponding manner. When a consumer chances to find a stale egg, he returns it to the dealer, who in turn charges it to the association, which reports the matter to the farmer. The method is a protection to all parties concerned, and is said to meet with much success. The eggs are delivered to the dealer in cases containing 5 dozen each.

THE INFLUENCE OF THE DISCOVERY OF THE RELATION OF BACTERIA TO DISEASE ON THE PRACTICE OF MEDICINE EXCLUSIVE OF SURGERY.

AWARDED THE SCHUYLER ALUMNI PRIZE FOR 1901.

By H. JUDSON LIPES, M.D., Lecturer on Obstetrics, Albany Medical College; Obstetrician to the Albany Guild for the Care of the Sick Poor.

(*Concluded from page* 336.)

From Albany "Medical Annals."

Antitoxin of Diphtheria.—No more wonderful discovery in the realms of medicine was made in the nineteenth century than that of the antitoxin of diphtheria. The results that have thus far been obtained in the treatment of this dreaded disease with the antitoxin have been exceedingly favorable. The mortality from diphtheria has been reduced about half under the influence of this therapeutic measure. Reliable statistics show that in the cases submitted to treatment with antitoxin the disease pursued, in general, a milder and more favorable course. In cases seen, after the disease had progressed several days, existing manifestations of stenosis improved in a large number of cases, so that tracheotomy or intubation was avoided. Serious sequelæ with certainty attributable to the antitoxin have thus far not been observed.

The good effects of the antitoxin are experienced, no matter whether the diphtheria membrane exists in the nose, pharynx, vagina or uterus (Croffi), or in any other locality.

Personal prophylaxis by means of injections of antitoxin is being employed more frequently, but not so much as it should be done. The main objection that has hitherto stood in the way of its more frequent use was the fear of disagreeable complications due to the serum. With the present highly concentrated antitoxin, however, there need be no fear. The writer has used even as high as two thousand units as a prophylactic measure without any ill effects whatever.

By means of the modern prophylactic and curative treatment, diphtheria (now one of the more common of infectious diseases) will, in the not distant future, become one of the rare diseases.

Diphtheria Antitoxin Used in Other Diseases.—Not only has anti-diphtheria serum been used for specific treatment, but it has been used for example in the treatment of asthma.

Revillrod uses this serum in the treatment of asthma for the reason that it assisted in the elimination of the particular noxious substance which is expelled through the respiratory tract. The success which he obtained leads him to believe that this method of treatment is worthy of consideration and further study of the profession. It is also claimed that diphtheria antitoxin has been used with great success ("Journal de Médicine de Paris," March 4, 1900) in the treatment of whooping-cough. It is claimed to decrease the severity of the disease and to reduce the frequency and violence of the paroxysms.

Inoculation for Rabies.—Although the specific infectious agent in rabies has not been demonstrated, and although the inoculations made in persons bitten by rabid animals to prevent the development of this disease, do not involve the use of bacteriological methods, the discovery of the prophylactic value of these inoculations is a result of preceding bacteriological researches. The great utility of the method of vaccination against rabies is no longer seriously doubted by any one. For example, in the year 1891, three hundred and ninety-four persons were treated in the Pasteur Institute, the diagnosis of rabies in the biting animals being established with all possible certainty, and not a single patient developed the disease.

Tetanus Serum.—It is obvious that the outlook for serum-therapy in the case of tetanus in human beings is from the outset less promising than it is in that of diphtheria. As it cannot be determined from inspection that a wound is infected with tetanus-bacilli, the disease comes under medical observation only after the toxin has already invaded the central nervous system, and has induced more or less extensive and in part, perhaps, irreparable injury. In fact, as Lambert and others have shown, there are no tetanus bacilli alive in the wound at the time of the development of the symptoms of the disease in cases of tetanus. For this reason the cases of tetanus thus far treated with serum have not, on the whole, yielded good results, but as the antitoxin becomes more concentrated and larger doses used, the results will be greater. Lately numerous successful cases have been reported.

Antispirillum Serum.—Among the list of sera that used in the treatment of relapsing fever probably stands next to diphtheritic serum in value. As has been pointed out under "Diagnosis," it is of immense value in determining the presence of this disease, and, if so determined, a further attack is prevented by using the specific antispirillum serum.

Treatment of Bubonic Plague.—In the treatment of bubonic plague, prophylaxis consisting in disinfection, hygienic precautions and isolation is of utmost importance.

The successful immunizing of animals against the bacillus of bubonic plague—which, under the name of Black Death, once decimated the populations of the earth—so that the serum afforded protection, from injections of virulent cultures, was done by Yersin, Calmette and Borrel. Yersin has applied this serum to the treatment of bubonic plague in man and with very promising results. As in diphtheria, experience has shown that the treatment is more efficacious the earlier the stage of disease. Haffkine, in India, has recently applied his method of preventive inoculation to the bubonic plague, as he previously did with cholera, and apparently with equally good results.

In this country, investigation and experimentation with this serum, carried on at the New York Quarantine Laboratory, Staten Island, by Fitzpatrick, indicate that this serum is able to both prevent and cure bubonic plague.

Asiatic Cholera.—As in bubonic plague, prophylactic measures are of greatest importance in preventing the spread of Asiatic cholera. Since we have learned the natural habitat of the spirillum of cholera, we know that the fresh stools of the patient suffering with this disease particularly, in the early part of the attack, give rise to the dissemination of cholera. So that the proper disinfection of the alvine discharges is of the utmost importance.

That the anticholera serum is efficient as a protective is no longer doubted since Haffkine, in India, has succeeded in producing an artificial immunity against cholera infection by means of subcutaneous injections of cholera cultures in thousands of natives. The question as to the value of this serum in the treatment of patients already infected is still *sub judice,* but since the protective immunization has been so successful, we may hope for equally as good results when the serum is sufficiently potent.

Treatment of Tuberculosis.—But there is no subject of so much interest to the whole world as the prophylactic and curative treatment of tuberculosis. As we have already seen, immense good

has resulted already in the scientific application of hygienic measures in the prevention and cure of this dreadful disease, and, from the results thus far obtained, we are convinced that the ravages of this disease can be stopped as soon as every one has learned and adopts these precautions.

But while we are gratified at the results already obtained by prophylactic measures, we are searching after a specific remedy. Many efforts have been made to confer immunity to tuberculosis, and to effect the cure of tuberculosis by the same means, but without practical results. R. Koch endeavored to secure a direct and specific influence upon the tuberculous lesions by means of tuberculin. Koch's discovery of tuberculin must rank as one of the first importance in scientific medicine, on account of what it has led up to, even if—as appears probable—the final verdict may be that its therapeutic value is very slight. Diagnostically, as we have seen, tuberculin has proved an exceedingly useful reagent, but the therapeutic employment of this toxin (not an antitoxin) has not yet yielded satisfactory results.

Lupus.—Lupus is at times favorably influenced by tuberculin, but no case is yet known in which recurrence has not taken place. Ulcers of the larynx clear in a most remarkable manner after injections of tuberculin, and undergo healing; but in those cases also recurrence generally takes place. While tuberculous disease of bones and joints is not at all influenced by this treatment, intestinal and peritoneal tuberculosis appears to pursue a relatively favorable course.

The original tuberculin in the treatment of pulmonary tuberculosis has been almost entirely abandoned by physicians. Koch, after the failure of the original tuberculin, applied himself unremittingly to the improvement of tuberculin-preparations. According to Koch, tuberculin R exhibits distinct immunizing properties and gives rise to reaction in tuberculous subjects only when used in large doses. He recommends that this new remedy be employed only in recent, pure cases of tuberculosis uncomplicated by mixed infection. The clinical reports that have thus far been made with regard to the treatment of tuberculosis with T R show the freedom from danger that attends the use of the remedy, but little as to its therapeutic utility. Behring is of the opinion that tuberculin R is less well adapted for therapeutic employment in the case of human beings than for the fundamental inoculations of animals for the purpose of further immunization.

From the experiments conducted in the Bio-chemical Labora-

tory of the Department of Agriculture at Washington, De Schweinitz concludes that while the injections with tuberculin produce a serum containing antitoxic materia, the amount of this is small, and that the injection of the live culture is as yet the proper treatment.

The treatment of pulmonary tuberculosis by serotherapy is best summed up by Maragliano, who claims that the employment of serum in the tuberculous human subject is justified from a scientific point of view: (a) By the action of the serum against tuberculous poison; (b) by the analogy of the therapeutic process of the serum with the defensive processes of the organism in spontaneous cure. From a clinical point of view, the action of the serum is demonstrated in man: (a) By the fall of temperature; (b) by the disappearance of bacilli from the sputum; and (c) by the cure of broncho-pneumonic foci. The examination of one thousand three hundred and sixty-two clinical observations justifies the application of the serum to the therapeutics of human tuberculosis.

Thus we see that the results already obtained are significant and give promise of the cure of this widespread disease in the future.

Of the other sera, we might classify the antityphoid and antidysenteric sera as of doubtful utility.

Serum for Typhoid.—Specific immunization against experimental typhoid infection has been produced in certain animals by injections of living or dead typhoid cultures—the blood-serum of living or dead typhoid cultures. The blood-serum of animals thus immunized has been found to acquire protective and curative bactericidal and, perhaps, feeble antitoxic properties against the typhoid bacillus.

No marked results have been obtained as yet from the employment of typhoid-serum for the cure of typhoid fever in man.

Wright, in England, has tried inoculating certain British troops against this dread enemy of the soldier on foreign service, with evident success. For example, out of two hundred attendants, at the Maidstone Asylum in Kent, ninety-five persons were inoculated and none contracted fever, while of those who refused to undergo the process, nineteen suffered from the disease.

Of the cases treated by injections of the serum, it is a question of doubt whether other media, *e. g.*, normal salt solutions, would not have been equally efficient. But the fact that this serum seems to afford protection from typhoid fever, and aids us in the diagnosis

of this disease, leads us to believe that the time is not far distant when its antitoxic properties shall be discovered and prove of value.

Antidysenteric Serum. — Antidysenteric serum, mentioned above, has not received the study nor been applied as diligently as the antityphoid serum. The discussion of this subject may be dismissed by the statement that its value has been ascertained, in about the same degree as that of antityphoid serum.

Numerous investigators have produced and experimented with other sera which, however, are practically inert. This list would include antistreptococcus, antipneumococcus, antiamarillic sera, and others. Antistreptococcus serum has been used in various conditions with more or less practical results. While Marmorek claimed beneficial results from the employment of his serum in the treatment of erysipelas and other streptococcus diseases, Petruschky, who repeated Marmorek's experiments, was unable to confirm his conclusions. To estimate the exact present value of antistreptococcus serum is a matter of the utmost difficulty, inasmuch as the reports are so conflicting. Many of the cases reported are valueless, because cultures were not made, and consequently we are in doubt as to the nature of the bacterial infection. Scarlet fever, erysipelas, epidemic cerebro-spinal meningitis, puerperal fever, tonsillitis, and post-operative septicæmia have been treated with this serum. Marmorek claims to have seen marked improvement in phthisis when complicated by streptococci. The results obtained in this country have not been very encouraging.

Weir concludes that the antistreptococcic serum of Marmorek has some good effect in erysipelas, and probably in scarlatina; that it is yet to be proved as valuable in puerperal septicæmia, the present testimony leaning against its efficacy in such infections; that it is worthy of a further test in cellulitis, osteomyelitis and surgical peritonitis.

Malignant Tumors.—The treatment of inoperable cases of malignant disease by the injection of the toxin of erysipelas appears to have a distinct though very limited field of usefulness. (Fowler.)

Chancroid.—Moore claims that this serum proves a good prophylactic measure and assists in healing chancroid, and causes resolution in the majority of cases of inflammatory bubo.

In Smallpox.—Lindsay believes that the death of smallpox patients, which so often occurs about five days after the pustules have dried and have begun to be absorbed, is caused largely by

reinforcement of the specific virus of variola with pyogenic toxins. He has, therefore, used antistreptococcus serum, just before or coincident with pustulation, with excellent results.

The experiments of Huber and Blumenthal with the blood of persons convalescent from scarlet fever, measles, pneumonia and erysipelas, in the treatment of these diseases, while in another direction, gave promising results.

Curative experiments in man have also recently been made with the blood-serum of immunized animals, and of persons who have recovered from an attack of pneumonia. F. & G. Klempens have conducted some very successful experiments in this line.

Antipneumococcus Serum.—It is probable that the antipneumococcus serum may be able to prevent a general infection from taking place from the diseased lung, even though it may fail to influence the local process. Injections of that serum seem to be practically harmless. The number of cases reported, however, in which the blood-serum of animals artificially immunized against pneumonia infection has been used for the treatment of the disease, although considerable, is still too few to warrant the expression of any definite opinion as to the final value of this as a therapeutic agent.

We cannot yet accept the reports of cases of yellow fever successfully treated by the antiamarillic serum, since the etiological factor of that disease has not been fully established.

Antivenomous Serum.—Calmette, in a paper read before the International Congress of Hygiene, at Madrid, discussed the subject of antivenomous serum. The serum which he discovered and prepared, according to his claims, antagonizes the action of all venomous poisons. He says that the reason why certain others have not secured results as good as his is that they have not taken into full account the difference in weight between the animals experimented upon, and have, therefore, not used the serum in doses proportionate to the weight and resisting power of the animals employed.

The greatest obstacle in the way of immunization against serpent poisons is the fact that people liable to this active contagion are situated too distant for its application. Several members of the party sent by the French Government on an expedition, in charge of M. Raoul, to make researches in Malaita in regard to indigenous plants, were bitten by snakes while making their investigations, and they declare that their lives were saved by injections of Dr. Calmette's serum, of which they carried a liberal supply.

Thus we have seen the marked benefits every department of the practice of medicine has derived from the discovery of the relation of bacteria to disease.

In summing up his excellent review of the "Progress of Medicine in the Nineteenth Century," Dr. John Billings remarks: "All told, the most important feature in the progress of medicine during the century has been the discovery of new methods of scientific investigation, particularly in the field of bacteriology.

"These methods have been as yet only partially applied, and great results are to be hoped for from their extension in the near future. They will not lead to the discovery of an elixir of life, and the increasing feebleness of old age will continue to be the certain result of living a long time, for the tissues and organs of each man have a definitely limited term of duration peculiar to himself; but many of the disorders which make life a burden in advancing years can now be palliated or so dealt with as to secure comparative comfort to the patient, so that 'if by reason of strength' life can be prolonged beyond threescore years and ten, it no longer necessarily involves labor and sorrow."

HIS NAME.

There is a certain small boy who rejoices in the name of Waite Pearsall. He commenced to attend school a short time ago, and the teacher had quite an experience in finding out his name.

"What is your name?" she asked as Waite took his seat.

"Waite," said the boy promptly.

The teacher looked rather surprised, but said nothing for a few moments, thinking perhaps he was frightened. Then she asked again: "What's your name?"

"Waite," said the possessor of the name.

After another few minutes' silence the teacher, becoming impatient, exclaimed:

"Well, I've waited plenty long enough now. Please tell me your name."

That made the boys laugh, and finally the teacher understood.

"I've made it a practice to put all my worries down in the bottom of my heart, then set on the lid an' smile."—From "Lovey Mary," "The Century," January, 1903.

AVERAGE LENGTH OF HUMAN LIFE IS STEADILY INCREASING.

VIENNA, Nov. 20.—Medical men here are eagerly discussing a lecture by Professor Pfluger, of the University of Bonn, on longevity, in which he asserts that the average length of human life is steadily increasing. He maintains that one-third of all the deaths registered in Munich are due to heart disease, brought on by the immoderate use of beer, and that tobacco also claims a large percentage of the victims.

Among forty centenarians who have come under his notice there was only one smoker, while nearly all confessed to a moderate use of alcohol.

What Professor Pfluger most seriously warns people against is the thought and fear of death. The mind must be occupied, he says, in order to secure longevity. Hard-working men who retire rarely live much longer.

The German census statistics show that in 1871 the centenarians numbered 147 men and 287 women, but in 1900 only five men and thirty women.

The above press report is of interest. As is well known, in Munich the consumption of beer per capita is greater than elsewhere in the world and the percentage of heart disease is higher. Beer has a worse influence on the heart than either wine or whisky. Tobacco is better borne by adults and the aged than by youth. No child should be allowed to smoke before the age of twenty-one. Wine has been said to be the milk of old age; it should not be used until past the noon of life. That the German census shows a reduction of old men since the war with France is natural. The age of industrialism, of city life, of strain, of alcohol and of the venereal diseases with increase of tabes dorsalis and general paresis is the present age of Germany as it is of the United States. Only the sedate and the temperate in all things can expect length of days.—*Indiana Medical Journal.*

PHYSICIANS AND LONGEVITY.

It has often been said that it is not work but worry that kills. Perhaps no better exemplification of the truth of the saying can be found than the number of hardworking physicians, occupied un-

ceasingly with great problems in medicine, who have nevertheless lived to what may well be considered an advanced age. Virchow's long life of nearly 81 years of strenuous devotion to work, so recently closed, is only a type of the prolongation of existence and usefulness that has fortunately been the lot of some of the greatest of the medical investigators. Longevity has been the rule, however, not only for the laboratory worker who in the placid preoccupation of original observation avoids the distraction of mind and the diversion of activity incident on medical practice, but also for the man who is able to combine both successfully. In fact, while the average life of the practicing physician is the shortest of any of the professions, most of the great investigating practitioners have lived lives so long as to encourage every medical man to take up original observation, if with no other idea than that of assuring himself longevity.

The great Greek father of medicine, Hippocrates, set a worthy example by living until he was nearly 83 years of age. Galen, his worthy successor in influence, lived at least beyond his seventieth year. In more modern times Harvey, the discoverer of the circulation, always interested in medical investigations, yet never neglecting the practical side of medicine, passed his eightieth year. Ambrose Paré, the French surgeon, in spite of a life of trials and years of unhealthy camp life, lived to be nearly seventy-five. Harvey's great Dutch contemporary, Leeuwenhoek, the inventor of the compound microscope and the first investigator of microbe life, lived to be ninety-one. Morgagni, whom Virchow called the founder of modern pathology, had nearly completed his eighty-ninth year. Auenbrugger, the inventor of the method of percussion for the investigation of diseases of the chest, reached a similar advanced age. Scarpa, the distinguished Italian anatomist and "inventor"—according to the nonplussed medical student—of the triangle, reached the ripe age of 87.

It is not alone in past centuries, however, that physicians have completed the threescore years and ten that are the days of our years here on earth, yet have lived on to enjoy life in comfort and happiness. The nineteenth century, with all its bustle and rush, did not shorten the usual long life of the investigating physician. Louis, the distinguished French clinician, to whom America owes so much for the training of the great generation of investigating practitioners of the middle of the nineteenth century, in spite of a family sorrow that broke his spirit at 60, lived to be 85. Schoenlein, to whom so many of the present generation of German in-

ternists look back as a master, reached the age of 91. Traube, another distinguished German teacher, lived to be nearly 80. Cruveilhier, the great French anatomist and physician, lived to be past 82. Langenbéck, Skoda, Brodie and Cullen were well on their way to their eightieth year when death came. Sir James Paget was over 75. Velpeau, Magendie and Sir Astley Cooper were well beyond their seventieth year. The distinguished physiologist, Johann Müller, while occupying the chair of physiology and anatomy at Berlin about the middle of the nineteenth century, gathered around him perhaps the most distinguished band of medical students any teacher has ever had. Many of them were destined to longevity as well as fame. Among them beside Virchow were Du Bois Reymond, the physiologist, who died at 78; Helmholtz, the physicist, who lived to be 76, and Schwann, the founder of the cell doctrine, who died at 72.

Our greatest American physicians and surgeons, in spite of the trials of a new country, the harder struggle for existence and the hardships incident to practice because of the difficulties of traveling, bear very favorable comparison with their distinguished foreign colleagues in the matter of longevity. John Collins Warren, the first professor of anatomy and surgery at Harvard, lived to be 78. Edward Delafield, of New York, lived beyond fourscore years, while Jacob Bigelow, of Boston, more than completed fourscore years and ten. John R. Cox, the editor of the first American Dispensatory, reached the ripe age of 91. Dunglison, the well-known medical lexicographer, Alonzo Clark, whom many generations of medical students learned to revere, and Valentine Mott, great teacher and busy consultant, all of them lived to be over 80. So has Nathan S. Davis, the founder of the American Medical Association. Gross, the distinguished surgeon, died at 79, having declared it as his opinion at 75 "that any one who is used to work and gives it up may be considered a dead man." These are but a few of many who lived beyond the psalmist's limit without fulfilling his sad prophecy of subsequent unhappiness.

Nor are all the grand old men of medicine dead. Many of the greatest living physicians are over 70 years of age, most of them in the enjoyment of health and strength, though their lives have been full of faithful application to hard work. It is not as some one has said, that a man must live long to achieve fame, for most of the great physicians made the original observations on which their fame depends while still comparatively young. On the contrary, it seems that the faculty for intense and prolonged devotion

to work is the first requisite of a genius, and far from being morbid or unhealthy, is the natural exercise of the superabundant vitality that is in the man. Instead of looking for a short-lived generation of medical men then, because of the hurry of twentieth century endeavor, we may expect the race of medical patriarchs to be generously continued, for the investigation spirit is abroad, and physicians generally are rising into that higher plane of calm, original observation that fosters long life.—"Journal American Medical Association."

MEDICAL AMENITIES IN THE SEVENTEENTH CENTURY.

Dr. George Cheyne, an eminent Scottish physician and mathematician, born in 1671, settled in London, and later in Bath, where he died in 1743. He became very corpulent, but recovered health and activity on a milk and vegetable diet. Whereupon he was apostrophized by Dr. John Wynter, another well-known physician of Bath, as follows:

Tell me from whom, fat-headed Scott,
Thou didst thy system learn;
From Hippocrate thou hadst it not,
Nor Celsus nor Pitcairn.

Suppose we own that milk is good,
And say the same of grass;
The one for babes is only food,
The other for an ass.

Doctor, one new prescription try,
(A friend's advice forgive),
Eat grass, reduce thyself and die,
Thy patients then may live.

To this Dr. Cheyne replied:

My system, doctor, is my own,
No tutor I pretend;
My blunders hurt myself alone,
But yours your dearest friend.

I can't your kind prescription try,
But heartily forgive;
'Tis natural you should wish me die,
That you yourself may live.

—*New York Medical Journal.*

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

OBLITERATION OF THE URETERS.—M. J. Israel reports to the Société de Médicine de Berlin ("Gazette Hebdomadaire," March 15, 1903) the case of a man who had only one kidney, upon which a surgeon performed an operation, an incision for hydronephrosis, the result of which was a urinary fistula, followed by pyelitis and total obliteration of the ureter. He was able, however, to re-established the normal course of the urine by means of a rubber tube attached to the renal fistula by one extremity, by the other to the bladder, furnished with valves to prevent the return of the urine.

It is now more than six months since the instrument was put in place, and the urine has become perfectly clear and the symptoms of pyelitis have completely disappeared.

A case of the surgereter is given in the "Medical Annual" for 1891, which is of interest as compared with this given above:

On Feb. 1, 1890, before the Clinical Society of London, Mr. G. Twynean, of Sydney, reported a case of a child aged eight, which had been suffering from abdominal pain and hæmaturia for sixteen months. After a failure in arriving at a diagnosis by ordinary means, he explored the kidneys and ureters through an incision in the left linea semilunaris. A calculus was discovered in the right ureter, two inches from the bladder. The wound was closed and healed well. Three weeks afterward an operation was undertaken for the removal of the stone through an incision similar to that made for tying the common iliac artery. The ureter was found and easily isolated, and the stone was extracted with forceps through a linear incision. The wound in the ureter was stitched with fine silk, and a drainage tube was introduced to the bottom of the cavity, from which the urine soaked freely for three days. On the fifth day the urine ceased to flow from the wound, which then rapidly healed, the boy making a perfect recovery.

DANGEROUS ESSENCES.—At the session of the Académie de Médicine on the 10th of March, the conclusions on dangerous essences were finally voted ("Progrès Médicine," March 14,

1903). Professor Jaffroy took the place of M. Laborde as head of the committee, who was still indisposed, but has shown great zeal in this patriotic campaign. The conclusions follow:

"1. The Académie declares that all the essences, natural and artificial, without exception, as well as extract substances incorporated with alcohol or wine, constitute drinks that are dangerous and injurious;

"2. The Académie declares that the danger from these drinks results altogether from the essences and the alcohol they contain, and they should, whatever be their base, be proscribed, and that at least there is strong reason for taxing them very heavily, that it may in some measure be a preventive;

"3. The Académie points out in a particular manner the danger of the *aperitifs*, that is to say, of the drinks of essences and alcohol taken fasting. The fact that these drinks are taken before the meals renders their absorption more rapid and their poisoning properties more active."

These three conclusions were adopted unanimously.

Finally, to end this discussion, the commission on the question of alcoholism proposed a vote on the following request:

"The Académie expresses the hope that measures will be taken to diminish the sale of such drinks."

This request was carried by acclamation.

Let us hope now that these petitions will not rest in the office of the Minister with the sound sleep that characterizes the repose given to so many requests of Académies and Congrèses.

THE PROTECTION OF SPRINGS.—M. Roux presented to the Academy, on behalf of M. A. J. Martin ("Progrès Médical," March 14, 1903), the Inspector-General of Sanitation of the City of Paris, and M. Henry Thierry, Adjutant Inspector-General, the report of the local and medical inspection of the springs taken for the use of the City of Paris (année, 1903).

M. Chantemesse pointed out the importance of this work. It is to be hoped that the example given by the City of Paris for protecting the springs will be emulated. This is the means taken now to protect the community or the family from epidemics of typhoid fever like those that have disturbed public opinion for a long time past, and the present action seems to be the initiative of a most instructive course to pursue for the future. It will also be a suggestion to other cities to pursue a similar course.

TREATMENT OF DIPHTHERIA.—Under this title ("American Practitioner and News"), Dr. I. W. Pearce, of La Grange, N. C., states the way he treats diphtheria, and by which he has never lost a case, as follows: "If I can get perfectly fresh antitoxin I give it, but if it cannot be had perfectly fresh I do not. Whether antitoxin is given or not, I give ecthol in full doses appropriate for the age of the patient, every three hours, administered by the mouth. The entire fauces, larynx and pharynx are sprayed with a mixture of ecthol and peroxide of hydrogen, three parts of the former to one of the latter, every fifteen to thirty minutes. Calomel in small doses is administered every hour until the bowels are thoroughly moved. Nourishing and supportive diet is given at short, regular intervals, and everything done to make the patient comfortable in the way of supplying fresh air, etc. I have been using this plan, modifying it to suit the needs of each individual case, for several years, and cannot recommend it in too glowing terms to my fellow-practitioners, knowing that it will give good results and entire satisfaction if it is carefully and effectively administered and carried out. Nothing can save a patient *in articulo mortis,* and it is needless to try this in such cases, hoping to do something. . . . In a series of twenty-four cases which I have treated as above, seven received antitoxin and seventeen did not. The seventeen that did not get it did as well as those that did, as far as I was able to tell. All twenty-four cases recovered, and I attribute most of the remedial effects to the ecthol, which was used in all cases throughout the entire attack."

COLLARGOLUM.—Professor Netter, of the Trousseau Hospital, Paris ("Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris," January 22, 1903), reports that since publishing his first experiences with Collargolum he has used it in over 130 cases, both in the form of Unguentum Credé and by intravenous injection. The latter is used when a quick and energetic action is necessary, or when the condition of the skin will not permit the absorption of the ointment. The favorable influence of the medication is not always immediately noticeable, and in some cases it must be frequently repeated.

Professor Netter has had extremely satisfactory results in 9 pneumonias, 9 typhoids, 14 bronchopneumonias of all kinds, and 4 severe scarlatinas. In the diphtheria pavilion especially the treatment has given marvelous results in 37 cases; several malignant cases that seemed necessarily fatal were cured. He was also

well pleased with the results obtained in a puerperal infection, in one infectious and in one rheumatic endocarditis. He cannot sufficiently recommend the employment of intravenous Collargolum injections in acute endocarditis, from any cause, following Wenckebach. In two cases of pulmonary tuberculosis in the third stage, and in six cases of tubercular meningitis, no results were obtained.

URIC ACID AND ITS ELIMINATION.—Editorially ("The Medical Brief," February, 1900) this vital subject is ably considered. Investigation strengthens the belief that eating too much meat is responsible for the formation of uric acid in disease-producing quantities. The symptoms caused by an excess of uric acid depend upon the degree of saturation and whether these morbid products are circulating in the blood or are precipitated in the tissues or joints. The susceptibility of the various organs and the constitution of the individual also help to determine the symptoms; one person may have asthma, another an irritable bladder, and another sick headache or rheumatism. In the treatment diet is highly important. Meat once a day is often enough. Fresh fruit, especially apples, should be eaten in abundance. Tomatoes are excellent, so is asparagus. Baked bananas and well-done rice are excellent substitutes for meat. Pure honey is always allowable. In uncomplicated cases lithiated hydrangea will be the only remedy needed in addition to dietetic reform and plenty of water.

NEW SOURCES OF AND NEW USES FOR ALCOHOL.

ALCOHOL FROM THE JERUSALEM ARTICHOKE.

The price of combustible alcohol in France is nearly double what it is in Germany. In the latter country, it is chiefly the Irish potato that furnishes alcohol, while in France it is the beet root. The cultivation of the former costs nearly double that of the latter.

In commenting on these facts, a French writer recently called attention to a tubercle much neglected in France, much more rustic than the Irish potato, and of great saccharine richness—the "topinambour," or Jerusalem artichoke. It is easy and inexpensive to cultivate; it is not affected by dryness or dampness; it has no maladies; and it can be harvested when desired. In the most ordinary soil, the writer says, it will produce 300 quintals (66,138 pounds) of tubercles per hectare (2.471 acres), yielding 25 hecto-

liters (660.425 gallons) of alcohol at 20 francs ($3.86) a gallon, or a total of 500 francs ($96.50). The value of the by-product of these 300 quintals is also worth mentioning: 130 quintals (28,659 pounds) of pulp, excellent for fattening cattle and worth—valued at 2 francs (38.6 cents) the quintal—260 francs ($50.18), the leaves, about 70 quintals (15,432 pounds), in the form of ensilage, make a splendid fodder; the 3,000 to 4,000 stems when dried furnish a good fuel. It is stated that these by-products, if economically utilized, will almost pay the expense of culture, leaving the alcohol to bear only the expense of distillation. This alcohol can be substituted for oil in domestic and industrial uses, and the writer goes so far as to say that its cheap production will enable it in the future to compete with coal.

If this is true, it should prove a boon to French agriculture, for the coming harvest is the last one unaffected by the agreements made at the Brussels sugar conference—agreements which, if carried out, will virtually destroy beet-root culture in France.

Surely the suggestions herein given are worth a trial in America.

THORNWELL HAYES, *Consul.*

Rouen, October 18, 1902.

(From the same, October 21, 1902.)

ALCOHOL FROM ACETYLENE.—The producers of alcohol in France are somewhat disturbed because of the new invention by which alcohol is manufactured by synthesis by means of acetylene. Although the process is as yet too costly to endanger their industry, the members of the Society of Agriculture of the Nord, in a recent meeting, issued the following recommendation:

Considering the facts that alcohol manufactured from fruit and agricultural distilleries can be replaced by mineral fabrication by means of carburet;

That these carburets can be produced economically only in foreign countries possessing powerful waterfalls and special minerals;

That this manufacture will ruin the distillation of roots, grains, and fruits, to the exclusive profit of foreign countries;

The Society of Agriculture of the Nord recommends that a tariff of 50 francs ($9.65) per 100 kilograms (220.46 pounds) be placed on the carburets from foreign countries which are to be used for the manufacture of acetylene.

Pertinent to the preceding is the following brief report of Consul-General HUGHES, of Coburg, October 3, 1902:

ALCOHOL MOTORS IN GERMANY.

The recent agricultural fair at Halle has shown the wonderful strides that Germany has made within the last eighteen months in alcohol motors. This is due to a great extent to the personal interest taken in the subject of the use and application of alcohol for trade purposes by the Emperor, and also to the low price at which this spirit for fuel purposes (containing about 90 per cent. of pure alcohol) is furnished all over Germany—a quart costing only about 5 cents.

The great advantages of a spirit motor over the ordinary steam engine are that it is always ready for use, without preliminary warming up; it can be filled, oiled, and started in from two to three minutes; there is no constant supplying of coal and water, and no danger of fire or explosion; no permits are required from Government authorities, and there is no compulsory inspection; the spirit is easily obtainable in all districts; there is no smoke or smell; and the weight of a portable spirit motor is about one-half that of a portable steam engine of equal power.

With regard to cost, a large German firm that exhibited at Halle showed 6 to 8 horse-power portable alcohol motors for $973.30; 10 to 12 horse-power motors for $1,265.29; and 16 to 20 horse-power motors for $1,581.61. In the tests made, one trial showed a consumption of 0.42 kilogram (0.92 pound) of 86 per cent. spirit and 0.37 kilogram (0.81 pound) of a mixture of one-fifth benzol and four-fifths 86 per cent. spirit, in both cases per brake horse-power per hour. If our American automobile manufacturers wish to capture the German market with their lighter, better, and more stylish runabouts and pleasure wagons, I think they would do well to adopt alcohol as a fuel.

PHYSICIANS IN ECUADOR.—Consul-General Thomas Nast, of Guayaquil, November 12, 1902 (since deceased), reports:

As numerous letters are received from parties desirous of practising medicine in this country, asking if they will be allowed to practice without passing examination in Spanish, I wish to say that the law of this country requires all medical men arriving in the Republic to pass an examination before the medical board in Spanish before permission is granted them to practice. I may add that there are so many doctors here that unless the physician be a specialist, his chances of obtaining much practice is very doubtful; the market is overcrowded.

EDITOR'S TABLE.

SANITARIAN, MAY, 1903.

Embarrassment incidental to the death of the intended manager, under the new business arrangements, announced in October number, delays the completion of the organization. Meanwhile:

All Communications, business and otherwise, all exchanges and all publications for review, should be addressed to the Editor, as heretofore: Dr. A. N. Bell, 337 Clinton Street, Brooklyn, N. Y.

MORE ABOUT ALCOHOLISM.

Editor THE SANITARIAN:

I have been much interested in reading the editorial pages of your April number on alcoholism, embodying the conclusions of "the last half century's medical manifestos," with regard to the action of alcohol on the bodily functions, as presented by Dr. T. D. Crothers, and the abstract of England's recent license law which follows. The conclusions presented by Dr. Crothers are in evident accord with his well-known views regarding the nature of alcoholism *per se*—that it is a disease requiring, and, more or less, amenable to, medical treatment. The English license law, on the contrary, is evidently predicated upon alcoholism as a vice or crime, to be treated accordingly.

While I cannot fully agree with Dr. Crothers and his votaries in the statement that alcohol is always a poison and never a food, I fully agree with his strong presentation of the danger from the misuse of alcohol as a beverage and as a medicine, and, moreover, I as fully agree with him in his pronounced views on needful medical treatment of alcohol habitués.

The medical press has contained recently some rather remarkable reports from chemists as to the large proportion of alcohol contained in various advertised remedies, which are supposed to be of advantage in cases of neurasthenia, etc., and some of them are advertised as cures for alcoholism and drug addiction; whereas, a sufferer taking them for relief is more than ever made a slave, and it certainly appears to me that there ought to be some way to prevent the sale of these dangerous nostrums.

In common with many physicians, to my knowledge, who have given attention to the treatment of alcoholics in private practice, I have found it to be totally impossible to manage them by the re-

duction method, and it is evident that the future method of handling cases of alcoholism and drug addiction must be more and more in the hands of specialists, and particularly in connection with well-equipped institutions devoted to this work. I am glad to notice, in this connection, that THE SANITARIAN is carrying an advertisement of the Oppenheimer Institute, an institution with which I am well acquainted and have, for some time, patronized, with the most gratifying results.

M. D.

New York, April 9, 1903.

THE BILL INCREASING THE LICENSE FEE 50 PER CENT. HAS PASSED.

What the New York Bill Is Expected to Do.

Senator Raines, in introducing the bill, said: "This will drive at least 10 per cent. of the saloon-keepers out of business and add over five millions to the revenues of the State," and Governor Odell, in defending the bill, said: "Every decent, law-abiding citizen is aware that the present liquor tax law has succeeded in greatly reducing the number of places where liquor is sold, has driven out of business thousands of places which were menaces to public morals, and has reduced our prison population and diminished crime. Under the proposed amendment a still further betterment of moral conditions will result."

WHISKY AS MEDICINE.

Careful analysis of many patent medicines, as reported by Dr. Bumgardner in the Transactions of the Colorado Medical Society, 1902, and quoted in "American Medicine" and the "Texas Medical News," shows that most "bitters," "blood tonics," "sarsaparilla tonics" and "celery compounds" contain more bad whisky than any other beverage. Although the "good people" busy themselves in preventing a gentleman from drinking wine at his dinner or beer when he is thirsty, they frequently use some of the following humbug "tonics," as they see them daily recommended by ministers, preachers and Women's Christian Temperance Union people. The percentage of alcohol in these nostrums is given below. It must be remembered in this connection that light beer contains about 2 per cent. of alcohol, the light wines about 12 per cent., champagne about 25 per cent., and sherry and port about 40 per cent. of pure alcohol. Good pure whisky contains about 50 per cent. of alcohol. The analysis of the nostrums are as follows:

Greene's Nervura	17.2
Hood's Sarsaparilla	18.8
Schenck's Sea-weed Tonic	19.5
Brown's Iron Bitters	19.7
Kaufman's Sulphur Bitters	20.5
Paine's Celery Compound	21.0
Burdock's Blood Bitters	25.2
Ayer's Sarsaparilla	26.2
Warner's Safe Tonic Bitters	35.7
Parker's Tonic	41.6
Hostetter's Stomach Bitters	44.3

Millions of dollars' worth of these deleterious "bitters," "tonics," etc., are sold yearly, and multitudes of people who are grossly ignorant of the fact that all these nostrums contain the poorest kind of cheap whisky, or fusel oil and alcohol, secretly become drunkards acquiring the taste for this brand of bitters or that. Great temperance reformers and preachers give these nostrum venders testimonials that are advertised extensively throughout the country. With this knowledge one would think that Women's Christian Temperance Union advocates would not indorse and increase the sale of bad whisky nostrums when the real pure article may be obtained at half the price. If, as it is claimed, alcohol causes a large proportion of criminals, how many criminals yearly are produced by patent medicine venders? And what proportion of the responsibility shall we place on the clergy and Women's Christian Temperance Union workers for their share in advocating the use of patent medicines?

FEMALE VERSUS MALE INEBRIATES.

In a British Blue Book recently issued, Dr. R. W. Branthwaite, the inspector under the Inebriates' Act (1901), directly traverses the common and often expressed idea that a woman inebriate is more hopeless as regards reformation than a man. Speaking from his own experience, he thinks women quite as capable of reform from alcoholic habits as men, if not more so. He states that he has himself known women inebriates who have remained strict abstainers for so long a period as ten years without giving way once. While the weight of traditionary experience is against him, we shall all be delighted to know that his position can be sustained. But all through the ages, and in every clime which has left us historical records, the universal testimony is to the effect that, in vices of all sorts, when a woman is bad, she is "very, very

bad." Is it possible that this universal testimony can be altogether fallacious? The average goodness of woman is so far in advance of the average goodness of man that perhaps we men have selfishly hugged this theory by way of compensation.

A NEW TOTAL ABSTINENCE SOCIETY.

The "New York Herald," in its issue of March 17, tells of the organization in Jersey City and Chicago of the "Bartenders' and Saloonkeepers' Total Abstinence Society."

The story says that it is expected that nearly all the 1,800 members of the Jersey City local Barkeepers' Union will join the new society.

This move is very suggestive as to the kind of whisky the apron men in Chicago and across the river sell. Is it "Jersey lightning?"

The Chicago bartenders say they have organized for self-protection and in the interests of their employers.

A QUAKER'S TEMPERANCE LECTURE.

Several persons, among them a Quaker, were crossing the Allegheny Mountains in a stage.

A lively discussion arose on the subject of temperance, and the liquor business, and those engaged in it were handled without gloves.

One of the company remained silent. After enduring it as long as he could, he said:

"Gentlemen, I want you to understand that I am a liquor dealer. I keep a public house of ———, but I would have you know that I have a license and keep a decent house.

"I don't keep loafers and loungers about my place, and when a man has enough he can get no more at my bar.

"I sell it to decent people and do a respectable business."

He thought he had put a quietus on the subject and that no answer could be given. Not so. The Quaker said:

"Friend, that is the most damning part of the business. If thee would only sell to drunkards and loafers, thee would help to kill off the race, and society would be rid of them.

"But thee takes the young, the poor, the innocent and the unsuspecting, and makes drunkards and loafers of them.

"When their character and money are gone, thee kicks them out and turns them over to the other shops to be finished off, and thee ensnares others and sends them on the same road to ruin."

A FAITH CURE VICTORY.

The Appellate Division of the New York Supreme Court has reversed the verdict of the jury in the lower court, and ordered a new trial in the case of a faith curist of Mount Pleasant, Westchester County, who was convicted of failure to furnish medical aid to his two-year-old child, dying of catarrhal pneumonia, and who was fined $500. In the opinion of the Court, which was written by Justice Bartlett, two other of the justices concurring, it was stated that, while the existence of a legal obligation to provide medical attendance was granted, it did not seem that such obligation applied in every case of illness in children, and in this particular instance the prosecution had failed to show that the illness was serious enough to render the failure to summon a physician a punishable offence. This faith-cure victory, therefore, is no great cause for rejoicing for the Eddyites and others of their ilk, as it simply furnishes a needed lesson in the drawing of indictments. Justice Goodrich, one of the members of the Court, wrote a dissenting opinion which contains an admirable statement of a principle which applies, or ought to apply, to all problems of this sort. "The doing of an act or the omitting to do an act," he said, "which endangers the life and health of a citizen, endangers the peace and safety of the State, and cannot be justified under the plea of liberty of conscience."

EDDYITES AND OSTEOPATHS AND FAITH-HEALERS DEFEATED.

By the terms of a bill relating to the practice of medicine, as amended by the Senate and which the House passed with only one dissentient vote on March 27, healing by prayer for pay in Virginia will be unlawful and punishable by fine and imprisonment. Eddyites and osteopaths joined hands in the lobby for a bill amending the general law requiring the examination by the State Medical Board of all who practice medicine. The Senate's action of March 6 is a complete defeat for them. The Eddyites held that healing by prayer for pay should be licensed; the osteopaths wanted representation on the board, but failed to secure it.

MORTALITY AND MORBIDITY REPORTS AND REVIEWS.

NEW YORK.—The State is divided into Sanitary districts as follows: 1. *Maritime District:* Includes New York, Brooklyn,

Long Island, Staten Island and Westchester County. 2. *Hudson Valley District:* All the counties on either side of the Hudson River, except Westchester, to and including Albany and Rensselaer. 3. *Adirondack and Northern District:* The northern section of the State—the counties of Washington, Warren, Hamilton, Essex, Clinton, Franklin, St. Lawrence, Jefferson and Lewis. 4. *Mohawk Valley District:* Schenectady, Schoharie, Saratoga, Montgomery, Fulton, Herkimer and Oneida counties. 5. *Southern Tier District:* The seven counties along the southeast border of the State. 6. *East Central District:* Sullivan, Delaware, Otsego, Madison, Chenango, Onondaga and Cortland counties. 7. *West Central District:* Cayuga, Tompkins, Seneca, Schuyler, Ontario, Yates, Livingston, Genesee and Wyoming counties. 8. *Lake Ontario and Western District:* Oswego, Wayne, Monroe, Orleans, Niagara and Erie counties.—Bulletin for February, 1903:

Districts.	Population.	Total number of Deaths.	Death rate per 1,000 pop'n of—	Deaths under five years.	Zymotics per 1,000 —all causes.	Typhoid Fever.	Croup and Diphtheria.	Acute Respiratory Diseases.	Consumption (pulmonary).	Smallpox.	Cancer.
1.....	4,052,875	6,470	20.08	1,760	87	45	183	1,418	784	—	241
2.....	696,000	1,005	18.8	193	57	19	9	75	110	—	39
3.....	394,772	417	14.0	78	78	8	12	73	30	1	14
4.....	420,000	518	16.0	105	107	9	13	70	31	—	22
5.....	429,530	500	15.0	93	60	8	1	54	25	—	24
6.....	403,000	424	14.0	88	54	4	5	60	31	2	20
7.....	320,600	384	15.0	37	110	31	3	52	28	—	13
8.....	893,819	1,108	16.0	250	80	3	14	69	101	—	49
TOTALS:	7,910,600	10,826	18.0	2,604	82	151	240	2,071	1,160	3	422
Average last 5 years:		10,492	18.7	2,712	90	110	273	2,200	1,119	17	354

The death-rate increased over January from 17.0 to 18.0, the average daily mortality having risen from 361 to 386. *Grippe* caused doubtless 1,500 deaths this month, against 1,200 in January. From pneumonia there were 1,223 deaths, against 1,133 in January, and for Bright's disease 674 against 802. *Typhoid fever* has been excessive in both months, the epidemic at Ithaca, which has abated, and one at West Seneca, near Buffalo, contributing largely. *Smallpox* caused but 3 deaths, and very few new cases have been recently reported.

New York City, 3,732,903.—Deaths reported for the four weeks ending April 11, 5,348—1,652 under five years. Annual death rate, 18.66.—Deaths from typhoid fever, 40; measles, 29; scarlet fever, 72; whooping-cough, 29; diphtheria and croup, 202; tuberculosis pulmonalis, 725; other tubercular diseases, 123; acute

bronchitis, 141; pneumonia, 493; broncho-pneumonia, 317; diarrhœal diseases, 143; diarrhœa, under two years, 113; violent deaths, 216.

Decision on the Distribution of Milk.

On March 19 the Appellate Division of the New York Supreme Court rendered a decision to the effect that the section of the Sanitary Code which provides that "no milk shall be received, held, kept, offered for sale or delivery in the City of New York without a permit in writing from the Board of Health, and subject to the conditions thereof," is constitutional and valid under the police power of the State. In the case at issue, the main contention was that it was apparent on the face of the ordinance that it is unreasonable and void in that it makes it unlawful for hotels or even private consumers to have milk in their possession without a permit. Justice Laughlin, for the court, holds that the ordinance is susceptible of the construction that it is intended as a regulation of those offering milk for sale, rather than of consumers, and can be held valid in that respect.

CALIFORNIA.—The new State Board of Health appointed by Governor Pardee met at Sacramento, April 1, and organized by electing Dr. Matthew Gardner, San Francisco, president, and Dr. Newel K. Foster, Oakland, secretary. The other members of the board are Drs. Oscar Stansbury, Chico; W. Lemoyne Wills, Los Angeles; Wallace A. Briggs and Aden C. Hart, Sacramento, and Martin Regensburger, San Francisco.—Dr. Charles A. Ruggles, Stockton, who has served for fifteen years as a member of the State Board of Health, and for four years as its president, retired.

San Francisco.—Deaths reported during February, 633, which, after the deduction of 57 due to violence, leaves 576, equivalent to an annual death rate of 16.84 per 1,000. In February, 1902, the rate was 18.79 per 1,000. The principal causes of death were: Tuberculosis, 95; heart disease, 94; pneumonia, 61; Bright's disease, 42; cancer, 28; accident, 36; diphtheria, 14; suicide, 15; homicide, 6.

More plague: A Japanese woman who died in the week ended March 21—the first case since December 11.

Los Angeles, 135,000.—Report for March: Deaths, 269—30 under 5 years; death rate, 19.92. From diphtheria, 8; scarlet fever, 3; typhoid fever, 6. There were 55 deaths from tubercu-

losis, divided as follows: Natives of the Pacific Coast outside of Los Angeles, 7; from other parts, 48; 7 had lived here less than three months, 5 between three and six months, 4 between six and twelve months, 11 between one and five years, 1 between five and ten years, 20 over ten years; 1, life; unknown, 6.

COLORADO.—Denver, 150,000. Report for February, 1903: Deaths, 217—27 under five years. Premature and still births, 11; from phthisis, 54—50 contracted elsewhere; diphtheria, 4; typhoid fever, 3; erysipelas, 2; measles, 2. Death rate, 15.78. Cases of infectious disease reported: Diphtheria, 43; scarlet fever, 31; measles, 8; typhoid fever, 3; whooping-cough, 11; smallpox, 47; erysipelas, 2; chicken-pox, 1. Smallpox in Denver, 36—11 outside.

CONNECTICUT.—Mortality report, as per bulletin for March, 1,421, 127 less than in February, 182 more than in March of last year, and 49 more than the average number of deaths in March for the five years preceding. The death rate was 19.1 for the large towns, for the small towns, 17.9, and for the whole State, 18.8. The deaths reported from infectious diseases, including diarrhœal, were 357, being 25.1 per cent. of the total mortality.

Cases of infectious diseases reported: Smallpox, in 5 towns, 13; measles, in 80 towns, 948; scarlet fever, in 45 towns, 323; diphtheria, in 39 towns, 129; whooping cough, in 27 towns, 419; typhoid fever, in 13 towns, 88; consumption, in 8 towns, 22.

DISTRICT OF COLUMBIA, 298,019—90,973 colored. Deaths during the week ended April —, as compared with the preceding week, was 30 per cent. less. The mortality was 85 from all causes. In the former week it was 123, and for several weeks averaged about that number. Of the late decedents, 50 were white, causing a death rate of 12.5 per thousand, and 35 were colored, the death rate being 14. For all the deaths the rate was 14.8, as compared with 21.4 previous week, and 22.2 in the corresponding period of last year. The improvement in the health conditions, as shown by the mortality, was general. Deaths from consumption decreased from 21 to 15, pneumonia 9 to 7, affections of the heart from 16 to 9, diseases of the kidneys from 9 to 7. There was one fatal case of typhoid fever, 2 of whooping cough, and 4 of grippe. By violence 6 deaths occurred, 2 being suicidal, one of which was by gunshot and 1 by inhalation of illuminating gas. Of the four re-

maining deaths, 2 were by falls, 1 by inhalation of illuminating gas, and 1 by shock from burns of the body.

ILLINOIS.—Statement of mortality for the week ended April 11, 1903, compared with the preceding week and with the corresponding week of 1902. Death rates computed on estimated population of 1,885,000 for 1903 and 1,820,000 for 1902:

	April 11, 1903.	*April* 4, 1903.	*April* 12, 1902.
Total deaths, all causes	592	549	562
Annual death rate per 1,000	16.36	15.18	16.10
By sexes—			
Under 1 year	104	87	108
Between 1 and 5 years	72	61	55
Acute intestinal diseases	22	22	20
Bright's disease	27	33	24
Bronchitis	30	18	28
Consumption	59	68	55
Cancer	28	12	20
Diphtheria	12	8	14
Heart diseases	41	50	52
Measles	10	5	—
Pneumonia	135	105	107
Typhoid fever	7	5	7
Scarlet fever	7	8	15
Smallpox	3	1	—
Suicide	7	5	6
Violence (other than suicide)	19	26	23
Whooping cough	13	7	6

There were twenty-one cases of smallpox sent to the isolation hospital during the week. Of these five were negroes, six were under 6 years of age, eighteen never had been vaccinated, and the remaining three had old, doubtful scars, said to be from vaccination in childhood. The hospital record for the year follows: January, 50 cases; February, 55; March, 60; April 26 cases to date; total, 191 cases received; deaths, 28; discharged recovered, 106; remaining under treatment at the close of the week, 57. Last year at this time there were forty in the hospital. Two deaths occurred during the week.

INDIANA.—The regular monthly reports to the State Board of Health in February show that: Influenza prevailed extensively,

from which there were 56 deaths. The type was severe and seems most frequently to leave an impression upon the nervous systems. Smallpox was very slightly less prevalent than in the preceding month, there being 889 cases in 59 counties, with 50 deaths. Bronchitis and tonsillitis were widely spread, and diphtheria increased slightly.—The total number of deaths was 2,677, an annual rate of 13.8. This is a decrease as compared with the same month of last year. There were 464 deaths under one year of age, and 693 of sixty-five and over. From certain diseases the deaths were as follows: Pneumonia, 339; tuberculosis, 342; cancer, 92; influenza, 56; diphtheria, 53; smallpox, 50; typhoid fever, 49.

The city death rate was 17.3, which is 3.5 higher than the average rate for the whole year. Exactly the same rate existed in February, 1902. The country death rate was 11.9, which is 1.9 less than the State average, and 1.7 less than in the same month last year. Consumption prevailed more extensively in the cities than in the country, the rate per 100,000 being, respectively, 195.4 and 137.8 per 100,000. Pneumonia also prevailed more extensively in the cities, rate 236.4, country 190.4. Of the smallpox deaths, 43 occurred in the cities and 7 in the country; 38 smallpox deaths occurred in Indianapolis.

Recent sanitary legislation in Indiana inhibits school children "if infected with any communicable disease, or if it or they have been exposed to any communicable disease," to attend school or appear in public. And all school teachers "shall exclude from the schools all such children, unless a written permit to attend is given by the health officer having jurisdiction." Health officers are required to attend "a meeting of the State Board of Health, when requested by the latter, for consultation or conference concerning the restriction and prevention of contagious and infectious diseases, or for the consideration of attaining important sanitary matters, and the expense of the delegate shall be paid by the board appointing him."

IOWA.—Outbreaks of infectious diseases were reported to the Secretary of the State Board of Health during February as follows: Diphtheria in 6 localities; measles, 5; scarlet fever, 24; typhoid fever, 3; smallpox, 17.

LOUISIANA.—New Orleans, 310,000—83,000 colored. Report for March: Total deaths, 560—214 colored; 80 under 5 years —29 colored. Annual death rate, white, 18.29; colored, 30.94: 21.67. Deaths from typhoid fever, 6; diphtheria and croup, 1;

pneumonia, white, 25; colored, 23; tuberculosis of the lungs, white, 38; colored, 44; influenza, 28; Bright's disease, white, 34; colored, 20; cancer, 16—10 colored.

MAINE.—Twelfth report of the State Board of Health, for the two years, 1901-1902. The tardiness of the report is attributed to the constantly threatening aspect of smallpox, necessitating the personal attention of the secretary, and increasing the amount of office work. It is a volume of 325 pages, sixty of which are devoted to "subjects of correspondence," comprehending inquiries and replies on a great variety of subjects relative to effective sanitary work, and particularly with regard to smallpox, on which there is an excellent paper by Dr. Frederick H. Dillingham, Assistant Sanitary Superintendent of New York City.—Infant feeding is also the subject of a special and comprehensive paper dealing with it in detail.—Abstracts from the reports of the local boards of health take sixty pages. These indicate an apparently complete organization of local boards throughout the State, which, taken altogether, present an excellent status of sanitary work.

MICHIGAN.—The Secretary of the State Board of Health reports for March, 1903: Compared with the preceding month, intermittent fever and typhoid fever were more prevalent; and smallpox, erysipelas, inflammation of bowels and diphtheria were less prevalent. Compared with the average for March in the 10 years, 1893-1902, scarlet fever, smallpox, whooping cough, and typhoid fever were more than usually prevalent; and consumption, inflammation of kidneys, intermittent fever, erysipelas, inflammation of bowels and remittent fever were less than usually prevalent. The diseases which usually cause the most sickness in Michigan at this time of the year were slightly less prevalent than usual in the March just passed. This lessened prevalence was apparently due to the about nine degrees higher than average temperature, and the less than average amount of ozone present during the month.

Of the Most Dangerous Communicable Diseases.

Including reports by regular observers and others, *meningitis* was reported present in Michigan during the month of March, 1903, at 7 places; *whooping cough* at 51 places; *diphtheria* at 62 places; *typhoid fever* at 62 places; *measles* at 120 places; *scarlet*

fever at 147 places; *smallpox* at 169 places, and *consumption* at 189 places.

Of smallpox, since the first of January, 1903, there have been 320 new outbreaks reported, 247 final reports of outbreaks closed have also been received, and in 150 instances, or 61 per cent. of those outbreaks, the disease was restricted to the one house where the first case occurred. The 247 final reports show that 1,666 cases occurred, including 7 deaths.

Considerable trouble is still experienced in restricting the spread of the disease, largely because the disease is not at first recognized as smallpox, but is called chicken-pox, "Cuban itch," "Bean itch," or almost any name except smallpox, and is therefore not reported to the local health officers so that action may be taken for its restriction. There are still a few instances where the fault is with the local health officer, who refuses to accept the diagnosis of smallpox when it is first reported, and fails to do what the law requires for its restriction.

The total number of deaths returned to the Department of State for the month of March was 3,034, or an increase of 278 over the preceding month. The death rate, however, was exactly the same as for the preceding month, being 14.4 per 1,000 population. The mortality was slightly higher than for March of the preceding year.—By ages, there were 582 deaths of infants under 1 year of age, 181 deaths of children aged 1 to 4 years, both inclusive, and 951 deaths of persons aged 65 years and over.—Important causes of death were as follows: Tuberculosis of the lungs, 197; other forms of tuberculosis, 40; typhoid fever, 48; diphtheria and croup, 34; scarlet fever, 22; measles, 29; whooping cough, 34; smallpox, 3; pneumonia, 403; diarrhœal diseases, under 2 years, 51; influenza, 140; cancer, 143; accidents and violence, 150.

Comparing March with the preceding month, there was an increase of mortality from all the causes stated above, with the exception of diphtheria and croup, which disease showed considerable decrease. The mortality from influenza was nearly double that of the preceding month. The death rate was slightly higher than for March, 1902.

MINNESOTA.—Minneapolis, 240,000. Registry of deaths for February, 1903: Deaths, 223—46 under five years; annual death rate, 11.15. Deaths from typhoid fever, 2; tubercle of the lungs, 29; other forms of tuberculosis, 5; diphtheria and croup, 9; cancer, 16; pneumonia and broncho-pneumonia, 41.

St. Paul, 175,000.—Report for February, 1903: Deaths, 128—31 under five years; death rate, 8.77; deaths from typhoid fever, 3; diphtheria, 5; tuberculosis of the lungs, 10; tuberculosis, 4; la grippe, 9; smallpox, 1; pneumonia and broncho-pneumonia, 26; cancer, 6.

MISSOURI.—St. Louis, 645,000—40,000 colored. Report for February, 1903: Total deaths from all causes, 864—173 under 5 years; death rate, white, 15.15; colored, 30.0: 22.57. Deaths from smallpox, 1; measles, 5; scarlatina, 4; diphtheria and croup, 22; whooping cough, 4; typhoid fever, 15; phthisis, 87; bronchitis, 50; pneumonia, 113; Bright's disease and nephritis, 36; cancer, 25.

NEW JERSEY.—Hudson County (Jersey City and environs), 421,692. Report for January, 1903: Total deaths, 652—177 under 5 years. Death rate, 18.5. Deaths from scarlet fever, 2; diphtheria and croup, 28; whooping cough, 5; typhoid fever, 2; phthisis, 72; bronchitis, 23; pneumonia, 92; still births, 56.

Newark, 266,000. Report for the week ending April. 11: Deaths, 81—20 under 5 years; death rate, 18.83. Deaths from scarlet fever, 1; la grippe, 2; phthisis, 15. Contagious and infectious diseases reported: Diphtherian-croup, 18; scarlet fever, 7; typhoid fever, 1; smallpox, 1.

NORTH CAROLINA.—Bulletin of State Board reports for February, 1903: Twenty-six towns with an aggregate population of white, 83,250; colored, 58,850: 142,100. Aggregate deaths, 176—91 colored: 42 under five years of age; still-born, 16. Death rates, white, 12.2; colored, 18.5: 14.9. Deaths from typhoid fever, 3; malarial fever, 2; diphtheria, 3; consumption, 25; pneumonia, 27; smallpox reported in 35 counties, an aggregate of 686 cases, no deaths.

OHIO.—Sanitary Bulletin, February-March: Cases of infectious diseases and deaths therefrom, during eleven weeks ending March 14, 1903—82 localities with an aggregate population of 1,405,852: Croup and diphtheria, 653 cases, 100 deaths; scarlet fever, 519 cases, 13 deaths; typhoid fever, 1,055 cases, 158 deaths; whooping cough, 198 cases, 18 deaths; measles, 651 cases, 2 deaths.—Smallpox, January 1 to March 14, 2,059 cases, 107 deaths.

How Cleveland Was Rid of Smallpox.

Soon after the first arrest of the epidemic of smallpox that began in Cleveland in 1900, in July, 1901, the Health Officer of Cleveland read a paper on "How We Rid Cleveland of Smallpox," to the Cleveland Academy of Medicine, in which he condemned the vaccine virus that had been used (with bad results in some cases) in the city, and gave to disinfection, and the redisinfection of houses in smallpox districts, the chief credit in freeing the city from smallpox. He was widely misquoted by the anti-vaccinationists as being opposed to vaccination itself, and Cleveland was pointed to as a city where vaccination had been abandoned and an epidemic of smallpox stamped out by disinfection. Cleveland was really rid of her smallpox before this redisinfection of houses was begun; it was brought about by the former health officer, assisted by the State Board of Health, by quarantine, by disinfection *and vaccination.* Cleveland continued free from smallpox for several months, but in August, 1902, another outbreak occurred, and gained epidemic proportions. The total number of cases for the year was 1,248, with 224 deaths, a death rate of 17.9 per cent. This was the "genuine, old-fashioned" smallpox. Many of the cases were of the most malignant form. It was exceedingly contagious, unlike the mild form which had hitherto prevailed, and was correspondingly difficult to control. A slight exposure often meant death. The epidemic gradually gained force, and rather rapidly mounted to its maximum for the week ending September 20, with 86 cases for that week. But there was a wonderful drop immediately thereafter, comparable to a mountain ascent, with a look down a sheer precipice on the other side.

How was this sudden ending of this epidemic of smallpox brought about? By *vaccination,* with, of course, isolation of the patients.

About the first of August, 1902, the health officer of Cleveland, Dr. Martin Friedrich, appointed 170 physicians as public vaccinators. These were appointed from among the best known men of the city, who set aside certain hours, announced in the papers, for free vaccination of all who presented themselves. The vaccine virus was furnished by the Health Department, and each lot of virus was examined to insure its purity. Public vaccination began August 15, 1902. The number of vaccinations paid for by the city in 1902 was 195,000 in round numbers, and the great majority of this work was done after August 15.—Cleveland is now again practically rid of her smallpox.

In view of this later history of "How Cleveland Was Rid of Smallpox," we scarcely think that even the anti-vaccinationists will dare to quote Dr. Friedrich as opposed to vaccination, or to point to that city as an example of having stamped out smallpox without the aid of vaccination. The lesson of Cleveland's smallpox epidemic is, Do not wait until the enemy is within the gates. Vaccinate in advance, and an epidemic of smallpox will be impossible.

Cleveland, 420,000. Report for March, 1903: Deaths, 764—254 under 5 years; annual death rate, 21.83. Deaths from typhoid fever, 35; smallpox, 3; diphtheria, 6; grippe, 6; whooping cough, 6; tuberculosis of the lungs, 58; bronchitis, 26; pneumonia, 71; broncho-pneumonia, 27; organic disease of the heart, 38; Bright's disease, 24; cancer, 22.

PENNSYLVANIA.—Philadelphia, 1,349,712. Report for week ended April 11, 1903: Deaths, 500—144 under five years. Deaths from consumption, 62; typhoid fever, 17; diphtheria and croup, 16; whooping cough, 7; smallpox, 5; cancer, 14 .

Pittsburg, 354,000. Report of the Bureau of Health for week ended April 11, 1903: Deaths, 150—51 under five years; annual death rate, 22.03. Deaths from typhoid fever, 10; whooping cough, 2; diphtheria and croup, 1; measles, 2; smallpox, 3; consumption, 8; pneumonia, 23; cancer, 4.

Cases of infectious diseases reported: Smallpox, 27; diphtheria and croup, 17; scarlet fever, 10; typhoid fever, 15.

PORTO RICO, 953,947. Superior Board of Health reports for February, 1903: Total deaths, 1,894—656 under five years. Death rate, 23.8; still births, 95. Deaths from cerebro-spinal fever, 10; diphtheria, 1; typhoid fever, 2; pneumonia, 56; grippe, 16; puerperal fever, 12; diarrhœal diseases, 33; anemia, 486; bronchitis, 111; tuberculosis, 117; heart diseases, 26; accidents and violence, 17.

UTAH.—Salt Lake City, 75,000. Report for February, 1903: Deaths, 83—17 under five years. Death rate, 13.28. Deaths from scarlet fever, 2; diphtheria, 9; tubercle of lungs, 3; pneumonia, 15; bronchitis, 3; cancer, 4.

WASHINGTON.—Seattle, 115,000. Report for February, 1903: Total number of deaths, 68—11 under five years. Death rate, 7.18. Deaths from pulmonary consumption, 4; pneumonia, 9; typhoid fever, 1; diphtheria, 1; cancer, 3.

WISCONSIN.—Milwaukee, 315,000. Report for February, 1903: Deaths, 409—144 under five years. Annual death rate, 16.88. Deaths from typhoid fever, 6; whooping cough, 5; grippe, 2; diphtheria and croup, 4; phthisis, 31; bronchitis, 32; pneumonia, 71; cancer, 20.

Cases of infectious disease reported: Smallpox, 20; tuberculosis, 4; diphtheria, 39; scarlatina, 17; typhoid fever, 13.

CUBA.—Havana and environs, 275,000—72,000 colored. Report for January, 1903: Total number of deaths 474, 17 more than in the previous month of December, but 54 less than in January, 1902. Death rate, 20.28. The increase, as compared with the previous month, has been due principally to the group of general diseases (+25), to those of the circulatory organs (+13), of respiratory organs (+7) and to early infancy (+6), only partially compensated by a diminished mortality in diseases of the nervous system (—12), of the digestive organs (—7), of the genito-urinary organs (—6), and from external causes (—7). There have been 4 deaths from typhoid fever, 94 from tuberculosis in its various forms, and 20 from cancer, against 1, 80 and 12, respectively, the previous month.

Havana, as well as the rest of the island, continues free from cases of yellow fever or smallpox originated within its territory. Reports have been received of cases suspected of being smallpox, both from this city and from other parts of the island, but after due investigation all have, so far, proved negative, turning out to be either chickenpox or measles.

CITY OF MEXICO, 368,777.—Bulletin of mortality for November, 1902: Total number of deaths, 1,534: typhoid fever, 4; typhus fever, 61; measles, 4; scarlatina, 3; whooping cough, 8; diphtheria and croup, 4; grippe, 5; tuberculosis, 146; syphilis, 8; cancer, 14; meningitis, simple, 44; apoplexy, 32; heart diseases, 55; bronchitis, 107; pneumonia, 97; broncho-pneumonia, 57; congestion of the lungs, 16; diarrhœa, infantile, 35; diarrhœa and enteritis, 334; cirrhosis of the liver, 81; hepatitis, 20; accidents, 31; alcoholism, 8; other causes, 358. Annual death rate, 49.80.

CHOLERA IN THE PHILIPPINES.

According to the most recent reports (telegraphic, April 15), cholera has attacked Captain Pershing's troops, who are operating against the Moros in the Island of Mindanao. Five cases and many suspected cases are reported. It seems probable that the

disease has continued among the Moros since its introduction among them eight or ten months ago, for owing to their unfriendly relations, it has not been possible for the sanitary authorities to effectually deal with it. Altogether, since the introduction of the disease into the islands, nearly a year ago, there have been upward of 80,000 deaths reported; and these figures probably represent but little more than half the actual mortality from it, since in many cases the cause of death has been concealed, or there has been no sanitary organization through which the true state of affairs could be reported to the health authorities. A fair numerical estimate of the havoc, which cholera has wrought in these islands would probably be placed at not less than 250,000 cases and 160,000 deaths.

THE PLAGUE IN INDIA.

The plague epidemic throughout India is steadily increasing. The deaths last week numbered 25,882, as against 25,870 for the previous seven days, and 12,695 for the corresponding week last year. In Bombay city there were 716 deaths; in Calcutta, 171; in Karachi, 25, and in Poona about 600. The Bombay Presidency reported 10,835 deaths; the Madras Presidency, 604; Bengal Presidency, 2,941; the United provinces, 2,995; the Punjab, 3,581; the Central provinces, 1,203; the Mysore States, 526; the Hyderabad State, 1,640; Central India, 435; and Kashmir, 1,717. The increase is general, but Poona and some other places seem to suffer out of all proportion to the number of the population. During the past fortnight the death rate in Poona has been about 500 per 1,000 per annum. In Calcutta the rate has never reached 100, while even in Bombay it has not exceeded 150 in any of the outbreaks.

THE CLEANSING OF FRUIT.

Consular Clerk G. H. Murphy, of Frankfort, transmits, November 7, 1902, a translation from the "Hanover Courier," as follows:

Dr. B. Ehrlich, a physician of Strassburg, has recently completed a course of experiments at the Institute of Hygiene and Bacteriology in the University of Strassburg in regard to the infection of fruit with bacteria, and has published a report on the subject in the "Archiv fuer Hygiene," in which he says: "Everyone knows that, in the condition in which it is placed upon the market, the surface of fruit is almost always unclean; but it is not so generally known that on the surface of such fruit millions of

microscopic creatures exist which may injuriously affect health. It has already been proven that in certain cases cholera, typhus, and tuberculosis have been transmitted in this way. The danger can be partially obviated by peeling or washing the fruit. In order to determine the degree of uncleanliness in market fruit, Dr. Ehrlich washed fruit of various kinds and then ascertained by a reliable process the numbers of the bacteria thus removed. In this manner, he found that 200 grams (about half a pound) of the fruits examined supported upon their surface bacteria in the following numbers: Huckleberries, 400,000; damsons, 470,000; mirabels (yellow plums), 700,000; pears, 800,000; gooseberries, 1,000,000; garden strawberries, 2,000,000; raspberries, 4,000,000; grapes, 8,000,000; currants, 11,000,000; and cherries, 12,000,000."

These figures teach how necessary it is that all fruit should be cleaned before it is eaten. In view of his experiments, Dr. Ehrlich recommends that before fruit is eaten, it should always be thoroughly washed, preferably in running water, and that the washing should be repeated when dry matter is observed to be adhering to the fruit.

THE NILE RESERVOIR.—The Assouan Dam has been completed and was formally opened on December 10, 1902. This date will be memorable in Egypt's history, for as long as the Nile continues to flow the great dam will remain as a proof of nineteenth-century enterprise. The dam is 1¼ miles in length, is 22 feet wide at the top, and has a parapet 3 feet in height running the whole length. Its maximum width at the bottom is 100 feet and the maximum height 130 feet. The height of the water held up when the reservoir is full will be 67 feet. The capacity of the reservoir is 1,000,000,000 tons. The total weight of the masonry is over 1,000,000 tons. The discharge of the Nile during full flood is 15,000 tons per second, or 54,000,000 tons per hour, when all the sluices are open, of which there are 180, 140 of which are 23 feet high by 6 feet 6 inches, and the balance 11 feet 6 inches by 6 feet 6 inches. —Extract from Consular Report.

INTERNATIONAL EXPOSITION OF HYGIENE AT BUENOS AYRES.

The Department of State has received from the Legation of the Argentine Republic, Washington, under date of October 27, 1902, notice of the International Exposition of Hygiene to be held at Buenos Ayres in connection with the second Latin-American Med-

ical Congress. The congress will hold its sessions in April, 1904. An invitation is extended to public and private institutions interested in the subject to participate in the exposition. Reduced rates for the transportation of exhibits have already been obtained from several steamship companies.

INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY AT BRUSSELS.

The Department of State has received from the Belgian Legation, Washington, under date of November 3, 1902, notice of the International Congress of Hygiene and Demography, to be held at Brussels from September 2 to September 8, 1903. An invitation is extended to the United States to be officially represented, and the wish is expressed, in behalf of the Minister of Foreign Affairs, that committees of propaganda, composed of persons eminent in medical science and hygiene, be organized in the different States, with whom the central committee at Brussels may correspond. The questions to be discussed will include bacteriology, microbiology, parasitology applied to hygiene; alimentary hygiene, applications of chemical and veterinary sciences, sterilization, use of antiseptics; sanitary technology; industrial and professional hygiene; hygienic transportation; best means of disinfection; administrative hygiene, aim and organization of medical inspection, quarantine regulations, and supervision of tenement houses; colonial hygiene, malaria, beri-beri, etc.; demography. Blank applications and copies of regulations and programmes, sent by the legation, are filed for reference in the Bureau of Foreign Commerce.

INCREASE IN THE MEDICAL CORPS OF THE NAVY.

The Fifty-seventh Congress in its last session provided for an increase of 150 numbers in the Medical Corps of the Navy, 25 of which are to be appointed each calendar year for six years. By the enactment of this law there is afforded to the young physicians of the country an opportunity to take service in the Navy of the United States and an assurance of the continuance of this opportunity for the next six years. The number of vacancies in this Corps occurring from retirements, resignations, and casualties average about ten a year, which, added to the 25 created by new legislation, makes 35 appointments open to ambitious young medical men yearly.

These appointments are to be made in the grade of assistant surgeon, and are within the reach of any well-qualified physician between the ages of 21 and 30 who is a citizen of the United States. Examinations to determine the fitness of candidates for appointment are held in Washington, D. C., and at Mare Island, Cal., and the board of examiners are in continuous session throughout the year. It is only necessary for any physician of the required age and citizenship desiring to enter the Medical Corps of the Navy to apply to the Secretary of the Navy for permission to be examined to ensure being given an opportunity. No political or other influence is required, and the only testimonials needed are those bearing on moral standing and citizenship.

The examinations to determine the fitness of candidates for these appointments are conducted in the following order: (1) physical; (2) professional; (3) collateral.

The physical examination is thorough, and the candidate is required to certify, on oath, that he is free from all mental, physical and constitutional defects. Acuteness of vision $^{15}/_{20}$ for each eye unaided by glasses, but capable of correction by aid of lenses to $^{20}/_{20}$ is obligatory. Color perception must be normal and the teeth good. If the candidate is found to be physically disqualified his examination is concluded. If found to be physically qualified his examination is continued as follows:

(1) Letter to the board describing in detail his general and professional education.

PROFESSIONAL EXAMINATION.

	Written questions.	*Percentages required.*
Anatomy (2) and physiology (1)	3	80
Surgery	3	85
Medicine	3	85
Pathology (1) and microscopy (1)	2	60
Obstetrics (1) and medical jurisprudence (1)	2	60
Materia medica and physiological action of drugs.	2	80
Chemistry (2) and physics (1)	3	60
Hygiene (1) and quarantine (1)	2	80
General aptitude	—	80
Literary and scientific branches	—	80
Required aggregate		750

Bandaging; tourniquets; four operations on cadaver; clinical cases (a written report being made in one case, giving history, diagnosis, prognosis, treatment, one prescription, at least, being written out in full in Latin); urinalysis (chemical and microscopical examination of one specimen of urine); practical microscopy, and recognition of five mounted specimens (histological, pathological, and bacteriological); recognition of surgical instruments.

Oral Examination.—This follows the written work in each branch and the required percentage is made up from the combined results of the written and oral examinations.

The percentages given are not absolute, however, as losses in some branches may be made good in others, provided the standard is reached in the cardinal subjects of anatomy, physiology, medicine, and surgery.

Collateral Examination.—This embraces spelling, punctuation, the use of capital letters, grammar, arithmetic, geography (descriptive and physical), languages, history, general literature, elementary botany, geology, and zoology. While due credit is given for a knowledge of languages and the sciences it is not essential except in the case of physics. A knowledge of the common school branches is essential, and deficiency in this respect will cause rejection, even though passing marks may be gained in professional subjects.

These examinations, while necessarily thorough and comprehensive, are simple and practical, and are not beyond the attainments of any well-educated physician. The oral and written questions are similar to those asked by the best medical colleges in examination for graduation.

The future prospects of the medical officer of the Navy, both for promotion and professional opportunity, are very bright, and the plan of enlargement of the Naval establishment already adopted and authorized, as well as that in contemplation, gives assurance that this outlook will grow even more promising.

The Medical Corps of the Navy consists to-day of the following numbers and grades: One surgeon-general with the rank of admiral (equivalent to brigadier-general in the army); 15 medical directors with the rank of captain (equivalent to colonel in the army); 15 medical inspectors with the rank of commander (equivalent to lieutenant-colonel in the army); 85 surgeons with the rank of lieutenant-commander (equivalent to major in the army); 23 passed assistant surgeons with the rank of lieutenant

(equivalent to captain in the army) 56 assistant surgeons with the rank of lieutenant, junior grade (equivalent to first lieutenant in the army), with 152 vacancies. There are 27 vacancies in the grade of assistant surgeon for the year 1903.

Assistant surgeons, after three years' service as such, will be eligible for promotion to the next higher grade—that of passed assistant surgeon—and from a study of the above table it may be observed that the small number of passed assistant surgeons insures promotion to the middle grade—that of surgeon—after a short period of service. To illustrate, the junior officer of the grade of surgeon to-day has reached this grade after less than five years' service and is in receipt of a salary of $3,000 per annum. While this is somewhat exceptional, the prospects of promotion to this grade for the assistant surgeons now entering the service are very nearly as good.

The following is the pay table of the Medical Corps of the Navy:

	At Sea.	*On Shore.*	*Allowance per Annum.**
Assistant Surgeons, rank of Lieutenant (junior grade)	$1,650.00	$1,402.50	$288.00
Passed Assistant Surgeon, rank of Lieutenant	1,980.00	1,683.00	432.00
After five years in the service	2,160.00	1,836.00	432.00
After ten years in the service	2,340.00	1,989.00	432.00
Surgeons, rank of Lieutenant-Commander—			
After ten years in the service	3,250.00	2,762.50	576.00
After fifteen years in the service	3,500.00	2,975.00	576.00
Medical Inspectors, rank of Commander—			
After fifteen years in the service	4,000.00	3,400.00	576.00
Medical Directors, rank of Captain—			
After fifteen years in the service	4,500.00	3,825.00	720.00
Surgeon-General, rank of Rear Admiral	5,500.00	5,500.00	720.00

The professional opportunities afforded the officers of the Medical Corps are very good at present, and are constantly improving. The first assignment to duty of a newly appointed assistant surgeon is usually to some one of the fourteen naval hospitals, where

*Only when quarters are not furnished by the Government. Eight cents a mile is the allowance when traveling under orders.

he remains until the opening of the course at the Naval Medical School in Washington, early in October. At the naval hospitals the service is most instructive and valuable, the larger of these institutions having a capacity of from 15 to 200 beds, and at most times carrying a full quota of patients. The Medical School is essentially a post-graduate school, designed to fit the young officer for the intelligent application of his professional knowledge to the requirements of the naval service, and to give him a training in certain specialties peculiarly important to naval work and in which he has not had the opportunity or time to perfect himself in his college course. The course of instruction comprises the following subjects: Military medicine, military surgery, tropical medicine, naval hygiene—its chemistry and biology—quarantine, the duties of medical officers, hospital corps drill and administration, ophthalmology, naval law, manual of the sword and extracts from tactics, instructions in signals. Bacteriology, blood examination and the study of animal parasites form very important branches of this course, and are given in one of the most modern and fully equipped laboratories in this country. Five months is devoted to this school work, and after its completion the assistant surgeon is assigned to sea duty. Here, again, his work follows the line of advanced medical and surgical procedure. He is provided with the latest and best instruments of precision and operation, and is given every encouragement to perfect himself in the practice of his profession. The most recently constructed battleships and large cruisers are equipped with hospital facilities equal to those found in most of our best organized small cities. Vessels of this type carry a crew of from 600 to 700 men, and for the care of the sick of these small villages afloat there is furnished for the medical officer a small hospital of from 20 to 30 beds, an isolation compartment, a dispensary, and an aseptic operating room. These are equipped with every modern appliance for the prevention of disease, the care of the sick and wounded, for operative procedure, and for the prosecution of scientific investigations as far as practicable aboard ship. Other duties to which naval medical officers are assigned are those pertaining to the needs of navy yards, naval stations, receiving ships, and recruiting work. Opportunity frequently occurs also for attendance of medical officers upon the meetings of medical and other scientific societies both at home and abroad as the accredited representatives of the Navy Department and the Government.

BOOK REVIEWS.

MANUAL OF BACTERIOLOGY. By ROBERT MUIR, M.A., M.D., F.R.C.P. Ed., Professor of Pathology, University of Glasgow; and JAMES RITCHIE, M.A., M.D., B. Sc., Reader in Pathology, University of Oxford. American Edition (with additions), revised and edited from the third English edition, by NORMAN MACLEOD HARRIS, M.B. (Tor.), Associate in Bacteriology, The Johns Hopkins University, Baltimore. Pp. 585, with one hundred and seventy Illustrations. New York: The Macmillan Company. London: Macmillan & Co.

This is a thoroughly up-to-date manual of practical knowledge of the subject of which it treats. The advances in bacteriology during the three years since the issue of the second edition of this work have been both numerous and important, involving the necessity of adding several new chapters to this edition, without, however, adding much to the size of the volume, as space has been gained by the condensation of various subjects now requiring less elaborate treatment. Additions have been made to most of the chapters and several new subjects added, among which those particularly worthy of mention are the advances made in the bacteriology of the air, soil and water, to which a new chapter is devoted. The chapter on Immunity has been partially rewritten and extended so as to include the results of the most recent researches on the subject. There are also several new illustrations—all excellent—admirably elucidating the text. Altogether, the work is replete with knowledge of the subject, but devoid of redundancy, and is alike commendable as a text-book and laboratory manual.

HYGIENE AND PUBLIC HEALTH. By LOUIS PARKES, M.D., D.P.H. Lond. Univ., Fellow of the Sanitary Institute, and Member of the Board of Examiners; Lecturer on Public Health at the St. George Hospital Medical School; Medical Officer of Health and Public Analyst for the Borough of Chelsea, etc.; and HENRY KENWOOD, M.B., D.P.H., F.C.S., Fellow of the Sanitary Institute and Member of the Board of Examiners; Assistant Professor of Public Health at University College, London; Medical Officer of Health and Public Analyst for the Borough of Stoke Newington. 12mo. Pp. 675. Illustrated. Price, $3.00. Philadelphia: P. Blakiston's Son & Co.

What we had to say of the excellence of this book on receipt of the first edition, less than two years ago (Vol. 46, p. 564), is fully justified by the second edition—rendered necessary "within a year of the appearance of the first," from which it differs chiefly by the elaboration of the chapters on "The Contagia and Communicable Diseases," but besides this, advantage has been taken of the interval to fully bring up other subjects to date. For busy medical practitioners who would have a quick means of getting at the gist of sanitary subjects and questions at hand; for medical students as a text-book; for sanitary inspectors whose minds are not well stored with practical knowledge and would make good use of the pocket for a reminder; or for lay readers and housekeepers who would know how to take good care of themselves, as well as their brothers, it is alike commendable; for it concisely comprehends knowledge of the conditions essential to the protection and maintenance of health under all circumstances.

THE INTERNATIONAL MEDICAL ANNUAL: A YEAR BOOK OF TREATMENT AND PRACTITIONERS' INDEX. CONTRIBUTORS: Robert Abbe, M.D.; Bertram L. Abrahams, B.Sc., M.B., M.R.C.P.; Herbert W. Allingham, F. R. C. S.; James Cantlie, M.A., M.B., F.R.C.S.; Prof. A. H. Carter, M.D., F.R.C.P.; Prof. H. Dwight Chapin, M.A., M.D.; A. Hurry Fenwick, F.R.S.C.; A. E. Giles, B.Sc., M.D., F.R.C.S.; Edward W. Goodall, M.D.; Prof. G. M. Hammond, A.M., M.D.; Prof. H. Amory Hare, M.D., B.Sc.; Edwin H. Holthouse, M.B., F.R.C.S.; Robe Hutchison, M.D., M.R.C.P.; Robert Jones, F.R.C.S.; Theo. N. Kelynock, M.D., M.R.C.P.; Priestley Leech, M.D., F.R.C.S.; Prof. Henry P. Loomis, M.D.; James Kerr Love, M.D.; John Macintyre, M.B., C.M.; Wm. Milligan, M.D.; Keith Monsarrat, F.R.C.S.; Wm. Murrell, M.D., F.R.C.P.; Joseph Priestley, B.A., M.D., D.P.H.; Boardman Reed, M.D.; A. D. Rockwell, A.M., M.D.; F. M. Sandwith, M.D., F.R.C.P.; Prof. Robt. Saundry, M.D., F.R.C.P., LL.D.; W. Scott Schley, A.B., M.D.; James Shaw, M.D.; Walter G. Spencer, M.S., F.R.C.S.; A. H. Tubby, M.S., M.D.; Joseph G. Turner, F.R.C.S., L.D.S.; J. W. Thomson Walker, F.R.C.S.; Norman Walker, M.D. 1903. *Twenty-first year.* Pp. 750. Illustrated. Price, $3.00. New York: E. B. Treat & Co.

This volume eminently sustains the reputation which the preceding twenty volumes of the series have obtained, insomuch that the names of the contributors, as above, is a guaranty of its excellence.—Indeed, the Annual is so well known that notice need only

be taken of the principal change in the present issue is that of a general summary of the year's work, from which it is hoped that the general trend of opinion may be more quickly obtained.

REPORT OF THE COMMISSIONER OF EDUCATION FOR THE YEARS 1900-1901. Volume II. Pp. 1,296.—(Continued from March number.)

This volume comprises: Co-education of the Sexes in the United States; Educational Movement in the Philippines; List of Foreign Universities and Other Institutions of Higher Education; Report on Education in Alaska; Report on the Introduction of Domestic Reindeer into Alaska; Consular Reports; Universities, Colleges and Technological Schools; Professional and Allied Schools; Agricultural and Mechanical Colleges; Statistics of Normal Schools; Manual and Industrial Training; Commercial and Business Schools; Education of the Colored Race; Schools for the Defective Classes; Introduction to Mining Engineering. To which is added a Chapter on Current Topics. Altogether, the Report is singularly comprehensive of the status of education in all its phases and details in the United States, and much of foreign.

The most striking feature in the report is the enormous increase in the number of young men and women who are seeking a higher education, the total being almost double that of ten years ago. The total number of men in colleges, universities and professional schools is 75,472, as against 44,926 ten years ago, and the number of young women 27,279, as against 10,761, the total of both having increased from 55,677 to 103,351 in the decade. There has been a much larger proportional increase among the women students than among men—almost three-fold. In ten years they have increased from 8,075 young women in co-educational institutions, to 21,468, while in schools of technology they increased from 707 to 1,151, and in colleges for women only from 1,979 to 5,260. Of the total students, 63,843 were pursuing a classical course, 14,130 various branches of engineering, 9,081 general science, 3,843 agriculture, and 391 architecture. The only decrease noted is in the schools of theology, where the number of students has been gradually falling off for several years. The total is 7,567, a decrease of 442 from the previous year, and of 804 in five years. This is in marked contrast with the rapid growth of the numbers studying law, medicine, and dentistry. The law students numbered 13,642, an increase of more than 1,000 in one year, and 8,339 in ten years. There was an even greater increase in the medical

students, who numbered 26,757. There were 7,308 young women studying dentistry, and 4,429 studying pharmacy.

PROCEEDINGS OF THE CONNECTICUT MEDICAL SOCIETY, 1902. The one hundred and tenth annual convention, held at New Haven, May 28th and 29th. N. E. Wordin, M.D., Secretary, Bridgeport.

A volume of nearly five hundred pages, comprising twenty-odd special reports and papers and discussions thereon, of interest to all physicians. The Address of the President, Dr. T. H. Grannis, is particularly noteworthy for its exceptional subject, "The Relation of the General Practitioner to Growing Children," and its excellence as a trenchant characterization of prevalent conditions in conflict with healthy growth and development. But the *mother's* relation to growing children is shown to be much closer than that of the general practitioner. To bring it home to her, the Society could hardly do its clientele a better service than to publish this address in separate form, dedicate it to mothers, and disseminate it as widely as possible. "The Relation of the Country Well to Typhoid Fever," by Herbert E. Smith, M.D., is also a paper of special significance to the public weal. It sums up the death-rate of typhoid fever per 100,000 living population for the two decades, 1881-1890, and 1891-1900, and three years, 1898-1900. Also of Connecticut towns of 10,000 inhabitants or more in 1900, for the remaining towns, and for the State.—It is gratifying to notice that, from the data given, the death-rate has materially declined during recent years. "Connecticut's Influence in the Development of the American Hospital for the Insane," by Charles W. Page, M.D., is a particularly interesting historical sketch of a subject in which the medical profession of the State may justly take pride. "Dangers from the Indiscriminate Use of Morphia," by Dr. T. D. Crothers; and "The Medical Inspection of Public Schools," by C. P. Botsford, M.D., are also important contributions to preventive medicine.—Of the rest, except mere annotations of malaria, yellow fever, tuberculosis, smallpox and vaccination, the spread of disease by pests and pets, in reports under "Progress of Medicine," and incidental reference to well-known conditions promotive of typhoid fever, in several papers on the subject: the general theme is curative medicine. Interesting Appendices; Obituaries; Delegates to Conventions; Constitution and By-laws, and List of Members, follow.

ONE HUNDRED AND FIFTEENTH ANNUAL REPORT OF THE UNIVERSITY OF THE STATE OF NEW YORK, FOR THE YEAR ENDING SEPTEMBER 30, 1901.—Pp. 94-531.—Anson Judd Upson, Chancellor. State Document, Albany, N. Y.

A comprehensive summary of the work of the Regents of the University, and of the progress of Education in the State; its expenditures and how applied. But besides all this much useful information on education generally, together with the facilities for promoting it, is summarized and may be read with profit by all persons interested in educational progress—and who is not? Yet on turning the leaves and venturing to make a running comparison of the amount of useful information here summed up with what people we commonly meet seem to possess, we can but wish that the facilities for the distribution of such knowledge were increased manifold. For example, about libraries:

Really only one library in this country can be fairly compared with the New York State Library, the Library of Congress at Washington. Neither has the popular circulating element. Both have responsibilities which do not fall on the ordinary public library. There are nearly 1,100 other libraries in New York, for which the State Library is the center. It does much valuable work for the benefit of the State at large, which reaches the inhabitants through these libraries and other agencies, and necessarily increases the cost of administration, but gives the needed facilities to the State in this way more cheaply than they could possibly be afforded, except through a central library.

Following is a comparative statement based on official reports received in December, 1900, showing the volumes, staff and total salaries, excluding those for janitorial services in five libraries, three of which are much smaller than the New York State Library:

	Volumes 1899.	*No. on Staff.*	*Total Salaries.*
Library of Congress	957,056	230	$142,625
Chicago Public Library	245,248	151	132,944
Cincinnati Public Library	196,058	72	37,378
Buffalo Public Library	145,000	69	37,000
New York State Library, excluding bindery force (6), and those employed temporarily (at present 9)	410,766	44	33,239

FOURTH ANNUAL REPORT OF THE COLLEGE DEPARTMENT, pp. 400. *Ibid.*

Gives a full account of the degrees conferred and licenses issued in all departments in the State; summary of professional education in foreign countries, and requirements.—Colleges, professional, technical and other special schools, with statistics of faculties, teachers, and students, replete with information on higher education.

BULLETINS, REPORTS, REPRINTS, ETC., RECEIVED.

Patent and Proprietary Medicines, as the Cause of the Alcohol and Opium Habit or other Forms of Narcomania, with Some Suggestions as to How the Evil May be Remedied. Lewis D. Mason, M.D., Brooklyn, N. Y.

Report of the Commission to Consider the Question of a State Sanitorium for Consumptives. Irving A. Watson, M.D., Secretary of Commission. Concord, N. H.

Home Education Department, University of the State of N. Y. Bul. 41. Melvil Dewey, Director, Albany, N. Y.

Experiments on the Metabolism of Nitrogen, Sulphur and Phosphorus in the Human Organism. By H. C. Sherman, Ph.D. Bul. 121, U. S. Dept. of Agriculture, A. C. True, Director, Washington, D. C.

Persistence of Varieties of the Bacillus Diphtheriæ and of Diphtheria-like Bacilli. Anna W. Williams, M.D., Assistant Bacteriologist, Research Laboratory, New York City.

Involution of the Appendix. Horace Packard, M.D., and J. Emmons Briggs, M.D., Boston, Mass.

What Can be Done to Prevent the Spread of Syphilis. E. Harrison Griffin, M.D., New York.

Argyrol in the Treatment of Gonorrhœa. G. K. Swinburne, M.D., New York.

Argyrol in Ophthalmic Practice. Adolf Alt, M.D., St. Louis, Mo.

Report of Committee of Conference of the Medical Society of the State of New York. F. C. Curtin, M.D., Secretary, Albany, N. Y.

CONTEMPORARY LITERATURE.

HOW MR. ROOSEVELT LIVES AND WORKS.

The young men of the country will be entitled some time to know even more than they have as yet been told about the way in which President Roosevelt accomplishes so much and yet keeps in

prime order. His physical constitution was, of course, built up, as everybody knows, years ago by systematic exercise and much outdoor life. His mental vigor would seem to have been acquired by a somewhat analogous method. The President does not flinch from the task in hand. He has schooled himself to do the day's work as it comes. He has acquired to a marvelous degree the power of concentration and the habit of decisiveness. He arranges his day well, is very abstemious in eating and drinking, does not allow himself to be cheated out of a fair amount of exercise, does not rely in the least upon stimulants or tobacco, and, perhaps above all, never tries to surpass himself or to expend his reserve strength in the achievement of something exceptional. With matters of colossal importance to attend to, he simply does his best as he goes along, deals with every problem that arises in a simple, direct, and natural way, and thus finds the day sufficient unto itself. He borrows no trouble, sleeps soundly, and meets the morrow refreshed and with full courage.—From "The Progress of the World," in the "American Monthly Review of Reviews" for April.

A MAN'S IDEAL OF WORK.

I think that as a matter of fact a man's ideal of work grows in his breast as Burke's ideal of society, of the social order, grew in him. There is in every man a reflection of life, a vision and a sense of life, which he has got from observation and experience. It is not constant, but grows and changes; and it is never quite the same in any two human beings. There is also in every man an inner vision and sense of himself in the midst of life; of himself projected into life; of his single energy transforming somewhat, or conserving somewhat, of that he sees. The ideal of life is due to the attractions and repulsions of life as he sees it. The ideal of work is a part of the ideal of life. Neither is the result of conscious reasoning and willing. They are thrust up from deeps the reason never sounded; they summon from a height the will has never mounted.

Of necessity, the ideal of work is unattainable. Save in very rare and fortunate cases, it will not be straitened by any restraining sense of the limitations of one's strength, or correspond at all to one's actual talents and endowments. It will seldom, in any case, fall short of dignity and grace and power. Quite probably, it has taken its shape from the accidental direction of the man's first curiosity concerning life, or from the figures of men, enlarged to the eyes of experience, which chance may have erected

on his earliest horizons. The hue and color of it may be traceable to the atmosphere of his childhood; very likely, it will have a general character of achievement or of sacrifice, according to the preponderance of lights or of shadows on the landscape of his youth. In all cases, however, and at all times, it will relate itself to all of life he sees. That he should ever realize it, in any of its stages of growth and change, is, of course, inconceivable.—William Garrott Brown, in the April "Atlantic."

WALKING THE MOST WHOLESOME EXERCISE.

Walking is the simplest, the most natural and the most wholesome of all exercises. No athlete ever trains for a contest, no matter what its nature may be, without walking a considerable distance in the open air each day. Many keep in vigorous health by this alone, and, no matter what other exercise you take, you must walk. But, first of all, learn how to walk. A great many people walk in an aimless, shuffling manner, and secure but little benefit from the exercise. In walking for exercise, the effect is better if the mind is directed toward some pleasurable end. Walk with consciously directed movements until you have brought every muscle under perfect control of your will. Moping along in an aimless, lackadaisical manner does little good physically and harms one mentally.

The necessity of maintaining a proper, erect position of the body must, says a writer in the April "Cosmopolitan," be borne in mind. Bear the weight on the balls of the feet, keep the shoulders back and down, the chest high, but do not hold the abdomen inward, as is taught by many athletic instructors. Let it be relaxed, for this part of the body should move in and out with each breath. There should be perfect freedom to breathe normally.

BOYS IN TRAINING.

The first care of the school athletic trainer should be to remember that he is training boys, and that he has not full-grown men under his charge. The growing boy is capable of a great deal of work, but this should not be made too severe, or he will lose the nervous force which is at the bottom of all success in any kind of athletics. The exercise should be made as pleasant as possible, and the young athlete should not be allowed to specialize, or at least not in the same manner as the full-grown athlete. It is all very well for the young athlete to have his favorite event, and to have one in which he is most proficient; but he should also have a certain amount of sprinting, distance-running, hurdling, jumping

and especially exercise in some form of light gymnastics, such as the chest-weights, Indian clubs, or dumb-bells. This will give him the necessary reinforcing or auxiliary muscles which he will need later on, when, as a college man, he makes a real specialty of some event.

The principal should also be most careful in the choice of a trainer, who, because he is older, may exercise a very great influence on the boys' ideas of fairness and true sportsmanship.

With but one remark on diet, we shall turn our attention to training proper. The young athlete need not undergo any system of diet. He should be merely cautioned against eating too much pastry, etc.; and three or four days before a competition the trainer should ask him to give up everything but plain, healthy food, leaving out pastry, candy, and all sorts of highly seasoned viands: for if he attempts to put them under a strict regimen they will either go to one extreme or the other.—From G. W. Orton's "Training for Interscholastic Athletics," in April "St. Nicholas."

HOMES PAST AND PRESENT

Is the subject of an interesting and beautifully illustrated serial, by Waldon Fawcett, in the "Delineator." May number contains Kenmore—the Home of General Washington's Sister—Harewood, Claymount and Audley—all illustrated in detail.

"Probably worthy of first place in the category of mansions rendered famous on account of their occupancy by members of the Washington family is Kenmore, at Fredericksburg, Va., the magnificent homestead formerly presided over by Betty Washington Lewis, the only sister of George Washington. Kenmore was built in 1749 by Colonel Fielding Lewis, and hither he brought his bride, Betty Washington, immediately after their marriage. . .

"There is rare satisfaction in visiting Kenmore at the present time, not only because of the excellent state of preservation of the building, but because of the fact that the whole appearance of the interior is such as it was a century ago, the furniture, ornaments, and even the china having been preserved intact."

THE MODERN CENSUS.

"A Decennial Snap Shot of the Nation for the Benefit of All Time."

Since 1790 the area of the United States has increased from 827,844 to 3,622,933 square miles; the number of counties has increased from 307 to 2,867; and the total population has increased from 3,929,214 to 76,303,387, or nineteen-fold. There are four

States each possessing, in 1900, a population greater than that of the entire nation in 1790, at which time two of the four were an untrodden wilderness. The number of cities with a population of 8,000 or over has increased from 6 to 546, and the number with a population of 25,000 or over from 2 to 161. There are now 38 cities having a population exceeding 100,000, and 3 of these have over 1,000,000 each. In 1900 the record of capital, wages, and value of products of manufactures rises to figures almost beyond comprehension. The capital invested was $9,846,628,564; the salaries and wages paid amounted to $2,735,430,848; and the value of products was $13,039,279,566. In agriculture the figures are almost equally impressive. The total value of farms in 1900 was $16,674,690,247, and that of agricultural products in 1899, $4,739,118,752. To gather and collate such stupendous figures, not only with accuracy, but so swiftly that the record of population in 1900 appeared as quickly as did the little report of the first census, was a task of the first magnitude. It was indeed an evolution.

Such is the modern census. It is a decennial snap shot of the nation for the benefit of all time. Patrick Henry declared that there was but one lamp by which his feet were guided—Experience. But so important has the study of facts become that statistics presenting the facts analyzed and classified is the lamp which guides the statesman and the student of to-day.—From Director W. R. Merriam's "The Evolution of Census Taking," in April "Century."

LITERARY NOTES.

Ambassador White's Diplomatic Reminiscences.—Andrew D. White, who has been resting quietly in Italy since his release from the cares of the German Embassy at Berlin, has just sent to "The Century Magazine" the first part of a manuscript upon which he has long been engaged, consisting of reminiscences of his diplomatic career. The present part covers his recollections of Beaconsfield, the Emperors William I and Frederick, Bismarck, Browning, and other famous European statesmen and writers. Further papers will include recollections of his recent embassy to Berlin. The recollections of such a life are sure to be of very great interest. The papers will begin to appear in an early number of "The Century."

THE MACMILLAN COMPANY has just issued "Athletics and Outdoor Sports for Women."—A few of the principal articles and

their writers are: "The Physical Training at Home," by Anthony Barker; "Gymnasium Work," by Dr. Watson L. Savage; "How to Fence," by Regis Senac; "Basket Ball," by Ellen Bernard Thompson; "Swimming," by Edwyn Sandys; "Bowling," by Sophie Gundrum; "Rowing," by Lucille Eaton Hill, Director of Physical Training at Wellesley College, etc. The book should most strongly appeal to the ever increasing class of women who live in the open air half of the year, and also to women who have charge of physical training classes in colleges, as well as to all women who wish to become healthy and live a healthy outdoor life.

"Why the Mind Has a Body," by C. A. Strong, soon to be published by The Macmillan Company, is a philosophical essay on the relation of the mind to the body, the appearance of which is most timely, as it is based on the current controversy between the common-sense school of theorists, who maintain that the mind acts on the body, and the "interactionists" or "parallelists" who declare that the varying conditions of consciousness are only the natural sequences to changes in the brain.

THEATRICAL ATTRACTIONS.

To produce for the first time in New York a new play by a well known American author is quite an important achievement for a stock company; yet it has just been successfully accomplished by Mr. Proctor at his Fifth Avenue Theatre, where it scored an instant success.

The scheme of producing complete plays with strong, refined vaudeville between the acts, to avoid the long waits one has to endure in the average theatre, has been worked successfully from the theoretical stage to a now practical form of entertainment. The old idea of producing stock plays has now become *passe,* and the new form is rapidly becoming popular at all of Mr. Proctor's houses devoted to this idea. The theatre opens, say, at 1 o'clock. Six acts of vaudeville are presented, and then comes the first act of the play, followed by a good specialty which works before the front curtain and entertains the audience while the stage is being set for the second act. This policy is maintained throughout the play until the fall of the curtain upon the last act of the comedy or drama, whereupon the vaudeville section is put in motion again until the rise of the curtain on the play for the evening performance. Thus it may be seen that if you drop into one of the Proctor houses you are assured of entertainment of the proper sort at any hour of the day between 1 P. M. and 11 P. M.

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PREVENTABLE RESPIRATORY DISEASES.*

By J. O. COBB, M.D.,
Surgeon U. S. Public Health and Marine Hospital Service.

PNEUMONIA.

It is only in late years that this disease has been generally recognized as one belonging to the infectious group. All kinds of conceivable theories have been advanced to account for it being so widely disseminated.

Even at the present date few will believe that the effect of cold (as such) is not in itself the sole cause for pneumonia, but one will be more apt to accept the theory of infectiousness if told that there is as much, if not more, pneumonia in temperate climates than in the extreme cold of the Northern States or of Canada. Such, however, is a fact.

Because of the exposed condition of the lung to the vicissitudes of weather, and noting that the majority of attacks come on during the winter months, we long labored under the delusion that sudden exposure to cold and dampness were the sole etiologic factors in producing the disease. It will be attempted to present sufficient evidence to prove the position maintained by several writers that exposure to cold or cold and dampness are merely incidental and remote factors. That it is caused by the pneumococcus is as nearly certain as the skill of careful experimentation will allow.

The exposure theory has been severely attacked by many on purely clinical grounds and by none more logically than Woods Hutchinson when he pointed out that—

"Fatal lung diseases in any given race or class, particularly of tuberculosis and pneumonia, are in exactly inverse ratio to the amount of exposure to all sorts of climatic vicissitudes. Diseases

*Concluded from page 410.

of the lungs are emphatically diseases of city dwellers. ("Human and Comparative Pathology.")

His position is undoubtedly correct whether applied to man or bovines, and to make it more emphatic in reference to man, attention is directed to the mortality lists of certain cities and States. It is emphasized that pneumonia is a disease of overcrowding and not due merely to cold or exposure to cold or to constant living in dampness or a damp climate.

One will be astonished to find that statistics show that in the cold of the north, where the exposure must be severe, there is no greater ratio of fatality from pneumonia in a given number of population than in the milder climates further south, if the environment conditions are the same. That the percentage of deaths in a given number of cases of pneumonia is very much higher in the north during the extreme winter months there is not the slightest question. This I believe to be due rather to the heightened virulency and greater numerical dosage of the infecting organism at this time than to the cold *per se*. Knowing that there is a greater percentage of recoveries from the disease in the south, it is probably true that there are more cases to a given population than in the north. I have no way of ascertaining these figures, however, as the reported death rates are the only figures at hand.

It is quite true that nearly all the cases of pneumonia occur in the three winter months of January, February and March. But this is true of influenza also, and the explanation of one will probably apply to the other. For whatever be the cause it would also explain the greater frequency of nearly all the acute infections, especially of smallpox. Neither pneumonia nor tuberculosis is due merely to the greater degree of cold. I would seek the explanation for pneumonia and influenza in these months to the greater dosage of the contagium due to the overcrowding and overheating that one sees in theatres, street cars and other shut-up, stuffy places where the heat is great enough to desiccate the germs of these diseases which have been planted in such places, mostly by coughing and spitting. Fresh air and ventilation stop all of them promptly. If contracting a "cold" is the *sine qua non* for an attack of pneumonia, we should have the greatest number of cases in the fall and spring, for it is then certainly that we have a greater frequency of chilling of the body.

Auto-infection in pneumonia, directly into the lungs from the mouth and pharynx, is extremely doubtful. It is probable that the pneumococcus is first ejected by the saliva in spitting, and,

having dried, enters the lungs in dust, and this is what happens in overcrowding in our city lives.

The following mortality table was compiled principally from the census figures of registration cities and States:

	Population.	*Deaths from Pneumonia.*	*Per* 10,000
1. Boston	500,000	1,260	25.20
2. Worcester	118,421	191	16.12
1. Chicago	1,500,000	2,550	17.00
1. Milwaukee	250,000	260	10.40
1. New Orleans	265,000	500	18.87
2. Buffalo	352,387	559	15.86
1. Philadelphia	1,200,000	2,500	20.83
1. San Francisco	320,000	580	18.12
2. Los Angeles	102,479	128	12.49
3. New York City	3,400,000	9,070	26.67
2. St. Paul	163,065	133	8.15
1. Minneapolis	190,000	225	11.84

1=Average for 10 years.
2=1900.
3=Average for 4 years.

States, Census of 1900.	*Population.*	*Deaths from Pneumonia.*	*Per* 10,000
California (outside San Francisco)	1,142,271	1,090	9.54
Georgia	2,216,331	2,598	11.72
Illinois (outside Chicago)	3,122,975	3,331	10.66
Louisiana (outside New Orleans)	1,094,521	1,252	11.38
Maryland (outside Baltimore)	600,093	946	15.76
Minnesota	1,751,394	1,379	7.87

The question of influence of cold and crowding is very noticeable if the figures for the smaller and newer towns where there is little overcrowding are taken in comparison with large cities in the same localities. For example, take Boston and Worcester. In 1900, in Boston, with its overcrowding, there were 24.98 deaths from pneumonia to every ten thousand inhabitants, while in Worcester there were only 16.12. Making the parallel more remarkable, take Albany, with 17.74 to ten thousand, and we have Atlanta, with practically the same population, with 21 to ten thousand.

In comparing the States it was found that in those that are sparsely settled there is little pneumonia. This is true whether

north or south. Minnesota for the last ten years had an average of six deaths for each ten thousand population, a very small rate for pneumonia in a very severe climate. Even California and Louisiana are greater, with 9.54 and 11.38, respectively. Taking Chicago out of the calculation of Illinois it was found that that would make the population condition about the same as Indiana, and the percentage of deaths in these States is then practically the same, while Georgia, with a little less population than Indiana, has practically the same number of deaths from pneumonia.

There can be no doubt that this disease is one of city life rather than life in the country. It is the disease of segregation, not of isolation, and it would seem to be a disease of overcrowding rather than exposure to cold; hunger, cold and alcoholism being merely agents that favor the disease and apparently influence its mortality.

Bacteriology.—The disease is undoubtedly caused by Sternberg's organism, the pneumococcus. As far back as 1880 he called attention to this organism, which he had found in his own saliva. Experimentation led him to believe that it was the organism of specificity in pneumonia, and he published this fact in 1885. There is no doubt of his priority of discovery as to the organism itself and its actual and causal relation to pathology, and it is only fair that this honor be accorded him.

Incubative Period.—We have no way of ascertaining or even guessing as to the incubative period in man. There is one point just here that is necessary to mention and which has been referred to before, viz.: There is often well-pronounced prodromata, followed by chill and fever, and the most careful clinician is absolutely unable to detect the lung lesion by his ear, notwithstanding he may be on the *qui vive* for pneumonia from the very start. And "yet there must be a condition antecedent to these changes that constitutes the so-called 'first stage,' for which there is no anatomical indication." (Sturgis and Coupland. Quoted by Smith.) Here is certainly a colony of pneumococci growing on a respiratory mucous membrane, in this instance well down deep in the air vesicle itself. So far as our senses are concerned it is an invisible colony, undergoing the first phase of its growth, its second phase being the rapidly developed colony, causing an abundant outpouring of exudate, which, overflowing like a fermenting vat from one vesicle to another, speedily infects the entire lobe. The lung is the only organ of the body which is favorable for the growth of this organism. It grows on the meninges and in joints, though the change in media causes considerable change in its pathology and

its exudate. An interesting peculiarity is that, while the organism may grow and multiply in the blood, on the meninges and in joints, it will not cause pneumonia when injected under the skin or into the joints or meninges or into the blood. It seems to be necessary for it to be implanted directly on the lung mucous membrane, for while it is constantly present in the saliva and nasal mucus, it does not become pathogenic until it reaches the air vesicles, where it finds the proper medium. And another exceedingly queer thing is that while the organism multiplies on the upper respiratory tract as a mucous membrane parasite and causes no harm, it produces one of the most fatal of diseases if successfully planted in the air vesicle. Here we have an example of the wonderful effect the slightest change in the medium will make in the specificity of certain organisms.

Chief Sources of Infection.—It has been known for years that the common habitat, and the only known habitat, of the pneumococcus was the saliva and mucus of the upper respiratory tract. Sternberg discovered the organism in his own saliva, and it is commonly present in the mouths of most persons. It is also found on the nasal and pharyngeal mucous membranes of many people.

There has been much speculation over the *modus operandi* of infection. It hardly seems reasonable that the organism reaches the lungs by extension. It lives solely as an obligatory mucous membrane parasite in animal mucus, and so far as we know it is not facultative and will not grow in accidental media outside of the animal organism. It is more than likely that to be able for it to reach its destination of a field which furnishes the exact nutritive formula (the lungs) it must be ejected from the body in saliva or sputum and be desiccated. Then when re-introduced and planted on the delicate membrane of the air vesicle, other conditions being favorable, it will grow and multiply and produce the characteristic lesions of the disease. The animal condition necessary to incubate the organism when planted is anything that will lower the vitality either temporarily or continually. A sudden accidental plunge into water, or getting drenched in a cold rain, or exposure to severe snowstorms, excite the necessary cultural conditions for the growth of the organism, but, no organism, no pneumonia: that's certain!

It is a well-established clinical observation that the transitional stage from a nasal or bronchial catarrh is not an antecedent to pneumonia. The clinician is challenged to establish his first and preceding symptom as a "bad cold." The onset is more or less

sudden with such well-marked clinical manifestations that it makes one feel that a bad cold had nothing whatsoever to do with it. It is acknowledged that chilling may bring about the necessary fallowing of the soil so that, the organism being present, it will then grow, while under normal conditions the victim would have escaped, even though the cold were severe enough to frost bite. We know that a pigeon, which is refractory to certain infections, will rapidly succumb if its resisting power is lowered, by plunging it into ice water, say. There are many circumstances that one may relate to explain the lowered condition of man, such as getting drunk, severe and exhaustive labor, etc., but when we apply this line of investigation we must not lose sight of the fact that on close inspection of the conditions of overcrowding we find that the proportion of women infected is nearly as great as men.

The census figures show that in 1900, 58,340 men and 47,631 women died of pneumonia, the difference hardly being great enough to apply the exposure theory as the sole factor.

It certainly is a disease incident to overcrowding, and cold or dampness have nothing to do with its spread, though dryness is a great factor. Baker never said a truer thing than that it was a disease of winter and of *dry* winters. Starr and others think that the cold causes a greater virulency of the organism, thus accounting for the greater frequency and severity of winter cases. Still it is just as frequent in a given population of the south as in the north, though not so rapidly fatal. I think the more rational explanation is that in the severe winters the atmosphere, inside and outside, is much drier than at other times: and, the weather being severe, people tend to huddle more in theatres and places of amusement or in their homes. There is little or no ventilation for several weeks, and in the meantime the air of these places becomes more and more infected. The severity, then, of the disease in winter, it would seem, is enhanced for the very simple reason that the numerical invasion is so great that the lung is overwhelmed. Lower the standard of resistance, then, by a drunk, or lack of food, or by severe chilling, and the factor of dosage will account for the severity and the number of these cases.

A careful study of the clinical histories of cases in large hospitals is convincing that the "cold" theory is untenable. It is a disease incident to overcrowding and caused much by man's own fault, because it could nearly be wiped out by careful details of ventilation and disinfection. It kills as many people as tuberculosis, and it is increasing rather than diminishing. It is cer-

tainly appalling to think of this stupendous death rate; and it is more than discouraging to see that nothing is done to check, even in a measure, its spread.

Incubative periods of the exanthemata peculiar to school-children:

Smallpox.

Clinical, 9 to 12 days; detention period for exposed cases, 21 days. A recovered case should be isolated for 30 days after disappearance of all eruption and catarrhal complications.

Chickenpox.

Clinical, 14 days; detention period for exposed cases, 21 days.

Measles.

Clinical, 10 to 12 days; for exposed persons, 18 days. A child should not be allowed to return to school for 30 days after all disappearance of catarrhal complications.

German Measles.

Clinical, 15 days; for exposed persons, 21 days. A child should not be allowed to return to school for 15 days after disappearance of illness.

Scarlet Fever.

Clinical, 1 to 5 days; detention period for exposed persons, 17 days. A child should not be allowed to commingle with other children at home or at school until 30 days have elapsed from the disappearance of desquamation and all catarrhal symptoms. The entire body should be carefully examined for secondary and latent skin manifestations, which show that the case is still infective.

Mumps.

Clinical, 14 to 21 days; for detention of exposed persons, 25 days. A child should not return to school for 30 days after disappearance of all symptoms.

Whooping Cough.

Clinical, 9 days; for detention of exposed persons, 21 days. A child should be kept out of school for 30 days after disappearance of cough.

Diphtheria.

Clinical, 2 to 4 days; detention period for exposed persons, 14 days. In this disease the greatest caution should be exercised, for a recovered case may have a latent, virulent colony in its throat or nose. For the child's own sake it should not be allowed to return to school for 60 days after apparent recovery, regardless of the lurking danger there is in so many of them.

School Regulations for the Exanthemata.

Nearly invariably one will find that a case of measles, or scarlet fever, or mumps, etc., has developed in a child who is going to school. In most outbreaks in homes the initial exposure has come from the school.

To prevent sick children from continuing in school, which is bad for them and dangerous to others, teachers should be required to send such children home and not let them return without a certificate that they are free from a contagious or infectious disease. If out of school with one of these diseases, no child should be allowed to return without bringing a medical certificate from an *officer of the board of health* that recovery is complete and there is no further danger, because of the regulation lapse of time. The time when a child should be allowed to return to school should be a board of health regulation and not left to each and every doctor's opinion.

In most cities there are regulations that a child from a house in which there is one of these diseases cannot go to school until the quarantine has been raised from its home. This would not be necessary if isolation in the home could be safely carried out, but, of course, just here comes the trouble. After one has tried the experiment of keeping children of the same household separated and sees it fail more often than succeed, he is inclined to adopt the method of expediency and prevent any child from the home going to school during the quarantine. It is especially trying in attempting isolation if the parents desire all the other children to have the disease, as most of them do. Whatever plan is adopted must be uniform and not flexible. The rules must be for all or for none, and it must not be a subject for discretion for any person. Several cities have the rule that a child may return to school when it presents a certificate from its *attending physician* that it is well. This plan is entirely wrong, its weakness depending altogether upon the different ideas that each and every doctor is

sure to have. No such laxity should be allowed, for it is certain to lead to disaster. It must be in the hands of the board of health absolutely.

There is this advantage to the isolation plan and allowing the others to go free, and that is, if it be shown that by meeting certain requirements all the household will not be quarantined, this of itself will tend to make them isolate cases and prevent further spread in their own families, a thing certainly to be desired, and it is really the end for which we are striving. There is much real nonsense about our present quarantine regulations, governmental, State and municipal, and unreasonable restrictions tend to bring our efforts into disrepute. We should aim to educate the public, for without such aid we shall never succeed. The intelligent person cannot but feel that it is unnecessary to drag his little child off to a pest house, with all the terrors such an act brings to the child and its mother, when he knows that that child can be isolated in its own home without danger.

How the School Teacher Can Aid in the Prevention.

Most teachers are women, and they are ever alert for the health and welfare of their pupils. A talk of a few minutes with a lady teacher is nearly certain to lead off into a discussion of ventilation or something of the kind for the health and good of her children. It certainly seems that when they are so anxious to do good we should aid them in learning how.

The teacher can do much in drawing the attention of the child in many simple æsthetic things which will not only help now but will follow into its life of manhood or womanhood. The mere matter of using the handkerchief can be made to accomplish so much. A child should be taught that it is dangerous to spit or expectorate on the ground or floor, and that it should spit and sneeze into its handkerchief. Fortunately there are no spittoons in schools to get them into the spitting habit, for habit it is. Seldom does one see a woman spit on the ground or floor—never a lady. If a boy were taught that it is an ungentlemanly thing to do, the habit would grow less and less, especially if we could once have spittoons done away with. The danger of soiled hands and finger nails and the possibility of infection from putting the fingers into the mouth should be impressed on the child's mind time and time again.

The teacher, if she were given the power, would be on the watch for sick children and would send them home. They do that now

to some extent, but they should have more power. The teacher should know that some coughs may infect an entire school, and that all coughs denote unwell children—children who should be compelled to bring a medical certificate. Nearly all health boards publish bulletins or information for the public about the exanthemata, and teachers should be kept supplied with revised publications as they appear. These bulletins should be kept posted in the halls of the school buildings.

Another obligation health boards owe to the practitioner is to keep him supplied with all bulletins and information about epidemics.

In Chicago it is the duty of the teacher on noticing anything peculiarly wrong with a child to notify a member of the emergency corps of the board of health who is designated for the purpose. This is a good plan, and should be adopted in all large cities. During epidemics Chicago goes further and has a regular corps of visiting physicians, who must visit the school every day. This contact between the teacher and doctor is sure to educate her in detecting these cases. It is a fine system.

The teacher can and will do a great deal to aid us if he or she once finds out that his or her help is wanted and is needed. And we do need their intelligent aid. It is probably safe to say that 75 per cent. of all the exanthemata are contracted in schools.

The following rules are from the Philadelphia Board of Public Education:

"SEC. 3. When cholera, smallpox (variola or varioloid), scarlet fever, typhus fever, yellow fever, relapsing fever, diphtheria, diphtheritic croup, membranous croup, or leprosy, shall exist in the family of any pupil or teacher of, or any person connected with, any of the public schools of this district, or in the house in which any of said pupils, teachers, or other persons reside, all such pupils, teachers or other persons shall be excluded from school and the school building, and shall not be permitted to return until he, she or they shall present the certificate of the Medical Inspector of the Board of Health, or of such official or person as may be designated by that board, that the period of exclusion from school and the school building, on account of any of the diseases named, has expired.

"SEC. 4. When measles shall exist in the family of a pupil, or of any teacher of a public school of this district, such pupil or teacher shall not be permitted to attend school until he or she shall present the certificate of a physician, stating that all liability to

contract disease by contact with the members of the family has passed away.

"SEC. 5. Any pupil or teacher suffering from whooping cough, tonsillitis, mumps, chickenpox, contagious eye diseases, or parasitic diseases of the head or body, must be excluded from school until he or she shall present the certificate of a physician stating that all liability to communicate the disease to others has passed away."

The following is from the Boston regulations:

"No child who is a member of a household in which a person is sick with smallpox, diphtheria, scarlet fever or measles, or of a household exposed to contagion from a household as aforesaid, shall attend any public school during the continuance of such sickness, or until the teacher of the school has been furnished with a certificate from the Board of Health, or from the attending physician of such sick person, stating in a case of smallpox, diphtheria or scarlet fever that a period of at least two weeks, and in a case of measles of at least one week, has elapsed since the recovery, removal or death of such person, and that danger of the conveying of such disease by such child has passed."

And the following from Detroit, Mich.:

"(a) Smallpox.—Require pupils, before admission, to exhibit a physician's certificate of effectual vaccination. Exclude all pupils coming from houses where this disease exists, until thirty days after the Board of Health has removed the placard, and has given a certificate of recovery.

"(b) Scarlet Fever and Diphtheria.—Exclude all pupils coming from any house where the disease exists, until ten days after the Board of Health has removed the placard and has given a certificate of recovery.

"(c) Mumps, Measles, Whooping Cough, and Chickenpox.—Exclude the patient until complete recovery, as testified to by a written statement from the attending physician or from a parent that the patient is apparently in good health."

It will be seen that the only defect in these rules, in an otherwise excellent system, is the one allowing the child to return upon the certificate of its medical attendant. No such laxity ought to be tolerated, as a definite time must be fixed and a child must not be allowed to return until it can furnish a certificate from a proper officer of the Board of Health. The Board of Health should, as is done in some cities, notify schools of houses placarded, giving the names of children, so a teacher would know pupils from these houses were not coming to school.

The Hygiene of the School-room in Preventing Infection from These Diseases.

Most teachers ventilate their rooms as well as it is possible to do. Architects are improving the schools all the time in ventilation and they are doing much to prevent sickness of all kinds.

Inquiry of the superintendents of public schools in our largest cities reveals a sad defect in school hygiene in the very important matter of sweeping and cleaning.

Under janitors' duties it is noticed that most cities require that the rooms and halls shall be swept daily. One of our large cities requires that the floors and halls shall be scrubbed four times a year, a few scrub once a month, and one every two weeks. One large city has its Kindergarten rooms swept daily, and once every two weeks all floors are covered with sawdust, wet down with formalin and swept up before drying. Several cities have been experimenting with contrivances to prevent dust while sweeping. The following is from the rules governing the janitor of Detroit schools:

"98. All rooms, platforms, halls, stairs, water closets, steps and walks in yards shall be thoroughly swept each day after the afternoon session of school;

"99. (a) All walls, cornices and ceilings shall be dusted at least once in two weeks; and all furniture, such as desks, tables, pianos, etc., shall be dusted every day after rooms have been swept, or in time for the next day's session.

(b) Janitors and engineers shall be permitted to sweep halls, corridors and stairways after the afternoon recess, and teachers shall be requested to give janitors an opportunity to sweep rooms at 4 P. M., or as soon thereafter as the janitor may be ready to commence work, all work to be done subject to the discretion of the principal."

It would appear from reading all their regulations that school boards must have difficulty in obtaining appropriations for janitors' services in the cleaning departments. School-rooms are very dusty and the influx and outgoing from each room keeps this dust in constant motion. And what the scholars fail to put in motion the cleaners with their brooms and feather dusters do for them. Parents are awakening to the hygienic requirements of their children: school teachers and superintendents cry for better and cleaner schools: boards of health point out the dangers from dust —with what result?

Sweeping with a dry broom is a positive nuisance if nothing else. Dry brooms and dusters should not be allowed at any time or under any circumstances. The Board of Health of Milwaukee has experimented extensively with a bristle broom which feeds just enough kerosene oil over the bristles to moisten the dust when sweeping. The secretary of the board writes me that he has found the broom very satisfactory in this respect and better than any other system.

The next best plan is wet sawdust, which should be swept up while damp, and this should be done every night. The use of formalin in such quantities and in such a way cannot do any particular good, and the expense for this item should be used to better advantage for cleaning purposes. When disinfection is required we should not play at it, but use it in a scientific manner—and that is, in such quantities and under such conditions that we obtain a known result.

Sprinkling the floors either with so-called disinfectants or plain water before sweeping is a bad plan.

The floors should be mopped once a week and plenty of soap and soda used, nothing else being required. All the fluids and chemicals sold for this purpose are useless and entirely unnecessary.

The cleaning of schoolrooms is a very important hygienic measure, and all regulations covering it should be prepared by the Board of Health. All furniture, door-knobs, walls and hangings should be wiped instead of dusted. Every effort should be exerted to dilute the contaminated air of schoolrooms with fresh air, and after school hours the doors and windows of the schoolrooms should be thrown open and left so if in warm weather, but in winter this is impracticable because of freezing the pipes. But even then the windows can be left open until the temperature drops down nearly to the freezing point, and this length of time will afford considerable ventilation. The other means of ventilation depend upon the method used in construction and are not under discussion, as improvements in this phase of the question come about through natural evolution. Once every day, during the winter months, the schoolroom atmosphere should be saturated with aqueous vapor by means of steam set free. There is no better way of precipitating the ponderable contents of the air than by this method.

Teachers can do much to prevent coughing and spitting, by merely pointing out the æsthetic side of the question. A child should be taught to cough, spit or sneeze into the handkerchief.

Children with continual cough should be sent home: and all should be taught that putting the fingers in the mouth is dangerous.

In most of the schools the scholars drink from a common cup, either of tin or granite-ware, which is chained to the wall or faucet. That this cup is *ever* washed is unlikely; that it may be a conveyor of disease is possible. The small fountain jet is much preferable, and is perfectly clean and free from any possible danger.

In the times of epidemics the greatest care should be exerted by teachers to ferret out sick children. If a child is found in school with one of the exanthemata, it must be sent home immediately and the health authorities notified. It is pure nonsense to do as is done in some schools, to wash such a child's desk, pencils, etc., with some solution and sprinkle formalin just around its seat. This particular roomful of children should be immediately dismissed, and that entire room disinfected from that time until the next morning. This should be a well-established rule of action in all cases. It would seldom be necessary to close schools in epidemics if this plan were followed with each and every discovered case.

Details in the Management of a Case.

When the physician is called to one of these cases he usually finds that the little patient has been put to bed; and so often in the best bed and best room of the house. Right here there is very often a dangerous inadvertence on the part of the doctor in allowing them to remove the patient to another room, entirely overlooking the fact that in this short time the first room may have become infected. It is better, if practicable, to keep the patient where you find it, and then arrange the details of isolation. If a trained nurse is to take charge of the case she must be prepared to remain all the time. There must be no coming and going.

The room to which a patient is to be removed must be divested of all unnecessary hangings, clothing, etc., but nothing should be removed after once the patient has been placed in the room. There should be the greatest care in these details, for so often a closet full of clothes or other articles which are badly needed are overlooked, and they are nearly certain to be smuggled out.

From the beginning it must be understood that no flies or mosquitoes are to enter or leave the room. If the room is not protected with wire netting, some mosquito netting can be tacked over the windows. Every effort must be made to destroy flies which get into the sick-room.

It must be impressed upon the nurse, whether mother, relative or regular nurse, that in handling the food, etc., there must be no going back and forth through the house or other rooms. There is no danger for one on the outside to handle the bed pan if there be no other way of disposing of the dejecta. All that is necessary is to place a clean wet towel over the vessel so that the person handling it does not have to touch the vessel, which may be contaminated. It is a pure waste of time and material to put bichloride or other disinfectants in these vessels, as it would take hours to effectively destroy the bacterial content. There is practically no danger from the dejecta of any but a typhoid patient. The towel which was passed out with the vessel must be placed immediately in boiling water or bichloride, 1-1000. All towels, bed linen, etc., which have to be passed out to be laundered should first be soaked in bichloride for one hour and wrung out. There is then no further danger in handling such articles. The tray and the dishes should be boiled after use. On returning the tray and dishes the nurse should spread over them a wet towel. All scraps of food should be burned or soaked in bichloride by the nurse and none allowed to leave the room. Individual salts and peppers and such things should remain in the room. Those on the outside who handle anything from the sick-room should be told the necessity of thoroughly washing their hands each time an article is handled.

Steam should be constantly generated in the sick-room, to lay the dust and precipitate the ponderable air contents. It has the further advantage of preventing the patient from breathing back into his lungs this infected material, which is so often the cause of secondary pneumonia.

Each day of the sickness the nurse will want to dust and sweep the floor or carpet. She must not dust, but use a damp cloth, which is to be soaked in bichloride after using. If the floor is the bare boards, it is best to wipe or mop, but if there is a carpet, a good plan is to soak some newspapers in water or some deodorant and tear the paper into small bits and sprinkle them over the carpet quite generously. Gentle sweeping then will clean the carpet nicely and does not raise any dust. Another good plan is to take a new mop and wring it out in dilute ammonia or chlorides or water, and mop over the carpet. This takes up the dust and cleans the carpet. The common carpet sweeper of the house must not be used to collect this dust, which is very dangerous. If there be a fire, this collected dust should be thrown in and burned, or if not, it should be emptied into the slop jar and soaked with bichloride

for several hours. Mops and brooms and brushes must remain in the sick-room throughout, and on the termination of the sickness they must be soaked four hours in 1-1000 bichloride and left in the room for general disinfection. All swabs, gauze, sponges, etc., should be burned or soaked for a *day* in 1-500 bichloride. The patient should use gauze or clean rags for handkerchiefs, and they should be treated the same as the swabs, etc.

So soon as the physician gives permission for the little patient to be removed to a clean room, this sick-room should be made warm, and a tub brought in to bathe the patient if there is no bath-room immediately adjoining. The bath should be thorough and *include the hair.* Around the tub and covering the carpet as far as the door should be laid clean sheets. As soon as the patient has finished the bath, and without waiting to dry, it should be folded in a clean blanket and allowed to walk out or be handed out to some one on the outside. The nurse before leaving the room should have made everything ready for the disinfection, which will be described, and should then take her bath, not forgetting her *own hair.* She can then leave the room, shutting the door behind her, and the disinfection can commence immediately.

There is sure to be a certain number of fatal cases, and in the house of approaching death too often all quarantine restrictions are thrown to the wind and family and neighbors rush in and crowd around the little bedside, to be followed soon by the awe-stricken and curious children of the neighborhood. There is much commotion, and coming and going, that can be avoided, and the quarantine should not be relaxed at all in such unfortunate circumstances. If, then, a case terminates fatally, the strictest precautions should be used in removing the remains from the room. It is common practice to remove the remains from the room and for the neighboring women to come in and dress the child for burial. This ought not to be allowed. The remains should be prepared for burial in the sick-room, and be placed in the coffin there. All the details of precaution must be adhered to more carefully in fatal than in recovered cases, because there are so many loopholes for carelessness.

One point must not be overlooked, and it is that even the clinically recovered cases of measles and diphtheria may still be infective. This is especially true of diphtheria, and in the latter disease it would be well for the little patient to be moved to another room, but still isolated from his or her playmates for two months.

And after the final quarantine is raised, this room should also be disinfected.

Of course I am presenting the possibilities of isolation under the best environments; the ideal among the poor and ignorant is entirely impracticable. Still, if the ideals of the practitioner are high, it is astonishing how much can be accomplished—and it is the ideal we seek, though this must come about through rational and reasonable regulations, and by gradual steps.

Room and School Disinfection.

(It is not the intention to enter into the question in minute detail, but merely to point out the simple methods in most common use.)

Hoping to be properly understood and asking for the most generous construction of my language, it is with reluctance that the statement is made that not one physician out of every twenty knows how to scientifically disinfect a room. It is not alone the details that physicians do not know, but they lack the knowledge of the nature of the contagium, how it may be destroyed, and what is expected of each method of disinfection. One man will have an idea that washing the articles of furniture with an antiseptic solution and sprinkling formalin or the deodorants around on the carpet will disinfect the room. In the regulations of the school board of one of our big cities it is stated that if a scholar is found with any of these diseases, his desk, pencils, slate and seat must be wiped with an *antiseptic* solution and *some* formalin sprinkled on the floor around his desk. That room is then supposed to be disinfected—to be free from giving your child or my child a contagious disease. I am not criticising the officials of this school, not at all, nor the physician who more than likely got up such a regulation, but I do criticise the spirit of superstition and superficiality of the laity, and to a large extent even the medical profession, in accepting, without the slightest investigation, every new fad as a fetich, advertised as having phenomenal or supernatural power to destroy bacteria. There are many worthless deodorants and so-called disinfectants sold to the credulous public, materials claimed to destroy bacteria and prevent the spread of disease. Deodorants are necessary to have in the sick-room, and I do not for a moment condemn their use—as deodorants.

I must illustrate this phase of the question by relating an actual occurrence. A bright, intelligent consumptive fell into my hands and I immediately inquired what he did with his sputum. This

patient, upon the advice of a celebrated physician, was pouring a little of the chlorides into the cuspidor and around over the room as a general disinfectant. Plain water would have been as effective—probably more so, because at least this would have been used plentifully.

I once went with a prominent sanitary official to see some smallpox cases, two of them being confluent. Both of us handled them and touched objects in the room. After leaving the patients, the doctor came up and began spraying some fluid over me. Inquiry for such attention revealed that it was bichloride to disinfect my person. I submitted to this courtesy principally to test and ascertain the extent of his ignorance, which proved to be profound. As near as could be told he sprayed half an ounce of bichloride on the front of my coat, and it must be considered that I was honored for he did not use nearly so much upon himself. And yet I can vouch for this man's honor and integrity—also for his ignorance. He actually thought he was doing all that was necessary.

On another occasion I had a smallpox patient in my office and an officer of the city health board was called in. In going he said that we had better disinfect, and I asked him how, and he said: "Oh, just wipe off his chair with a little bichloride and sprinkle some around where the chair stood." Ridiculous! It is such absurdities that make it so hard to gain ground in preventive medicine.

Given the sick-room, how shall we proceed?—Where there has been a trained nurse in charge, the disinfector should find the room all ready for him, but if he has to attend to the details, he will first make a note of the size of the room, so he will know precisely the amount of the disinfectant which he must use and be certain to err on the right side. His next step will be to open up, haul out and shake out all folded fabrics and hang most of them on cords about the room. The drawers, closets, trunks, boxes, etc., must be left open. The bedding should be turned out. His next step is to make the room as nearly air-tight as he can with wedges, paper and paste, or gummed strips. In a well-constructed house the windows fit fairly well, and nearly all ingress of air can be prevented by driving in little soft pine wedges along the casing. One must be careful to examine where the upper and lower sashes meet, for here the wedges cannot always bring the two sashes together. If the wedges do not suffice to close the windows tightly, paper strips can be run up and down very readily. Old newspapers are commonly used, because they are soft and hold the paste

well. Flour paste is excellent. All cracks in the plastering or around the door or window casings, the cracks of all doors opening from the room (except the one for egress) and the ventilator, hot air or chimney openings thoroughly pasted over. On going out the door is fastened, and the bearings, or where the door comes in contact with the casing, is to be pasted over. If formaldehyde is to be introduced from the outside, the key-holes are not pasted over until the gas is introduced. The municipal ordinance covering disinfection of rooms is then to be pasted on the door and the people of the house informed that the room must not be opened until the inspector returns for that purpose. In many cities the room is sealed and the people told that it can be opened at a given time, and the inspector never returns. But one must see that such a system is bad, for often the rooms are opened up long before they should be. The inspector himself should come back and open that room, and the department should require that he report this fact on a regular blank. In New York and several other big cities this is made necessary by the very excellent system they have of sterilizing, by superheated steam, thick bedding, bundles and mattresses, which are not penetrated thoroughly by gaseous disinfectants. It has been shown repeatedly that bacteria inside of pillows and mattresses are not reached by sulphur fumes or formaldehyde. This routine of the steam chamber, after the superficial room disinfection, should be enforced in all municipalities. It is the only way to thoroughly disinfect the room contents and know that all organisms with their spores have been killed. The ordinary room disinfection makes it safe to handle mattresses, pillows, etc., and carry them through the streets in a covered wagon made for this particular purpose.

What method of disinfection shall we use? For fabrics, of course, steam or boiling are the ideal methods for effectiveness, but steam may not be available and boiling impracticable. It must be impressed on every one that articles going out to the steam sterilizer or to be boiled in the course of the sickness and before the room has been disinfected, must not be removed from the room and carried through the house dry. They must be wet down thoroughly with bichloride. Carpets and hangings must not be removed at all until they are made safe by the preliminary gaseous disinfection of the room.

There are three methods of producing disinfection by means of formaldehyde gas, viz.: Behm's sheet method, the Kuhn lamp, and numberless kinds and makes of autoclaves.

With the sheet method, a number of sheets are suspended on cords about the room and formalin is sprayed over those with Behm's apparatus and allowed to evaporate. The principle of the Kuhn lamp is to dehydrate wood alcohol into formic aldehyde. With the autoclaves formaldehyde is evolved by heat under pressure.

The only other reliable method of disinfecting a room is with sulphur dioxide in the presence of moisture. This gas can be obtained by merely burning the sulphur in the room. The gas is also put up in iron cylinders under pressure.

Assuming that disinfection by one of these gases is the only truly reliable and effective method, it will be necessary to point out briefly the details of handling each.

If an insecticide is desired, as well as a disinfectant, sulphur dioxide should be used. Rosenau has recently called attention in some careful experiments to the fact that formaldehyde does not readily destroy insects, especially the mosquito. Flies are just as refractory, and the effect on bed bugs is not mentioned by him or any writings available. My personal experience is that bed bugs are not destroyed by ordinary disinfection with this gas. Rosenau's experiments, then, can leave no grounds for doubt that flies and mosquitoes are not readily killed by formaldehyde.

It is very desirable that all insects in the sick-room should be destroyed. In the inoculable diseases, such as plague and diphtheria, it certainly is possible that the bed bug or mosquito might introduce the organisms; while a contaminated fly, escaping from the room, might reach the kitchen and plant a colony of diphtheria bacilli on food. This is possible. It has been seriously contended that fleas may convey the plague bacillus from one person and inoculate it into another. And this is possible, and, I think, probable.

For ordinary purposes an autoclave is very nice to work with, and it will cause less damage and less annoyance to the people of the house and be more satisfactory in results than any other method. If Behm's method is reliable in evolving the gas, as it seems to be, then the question will be much simplified and disinfection be more extensively used. Now that sulphur dioxide is being put up in cylinders, it can be handled just as easily as formaldehyde. Both methods are comparatively expensive. The Kuhn lamps for generating the gas from wood alcohol, Behm's sheet method, or burning sulphur in an iron pot, are the least expensive methods, and either will disinfect if properly used.

For superficial room disinfection, the U. S. Public Health and Marine Hospital Service prescribes the rules substantially as follows:

Sheet method with formalin, 6 ounces for each thousand cubic feet of room space, and exposure not less than five hours. (It is understood, of course, that this refers to nearly air-tight rooms.)

The lamp for generating formaldehyde from wood alcohol. Twenty ounces of wood alcohol to be burned in a thousand cubic feet of room space, exposure not less than six hours.

The autoclave requires thirteen ounces of formalin to a thousand cubic feet of room space and exposure the same as the lamp.

When sulphur dioxide is forced into a room from a cylinder, or liberated from a can or other receptacle, it must be in the proportion of 4 per cent. of the gas to the air contents of the room. If sulphur is burned it takes a little over four pounds to one thousand cubic feet of room space.

If the lamp is used or sulphur burned in the room the greatest precautions must be used to prevent fire. The lamp is supposed to be safe, but I nearly had a serious accident with one, because it was not noticed that in filling, the wood alcohol had spilled over, and this afterward caught fire. Certain samples of roll sulphur will splutter when burning and often little particles are thrown out to considerable distances and burn small holes in the carpet. A safe thing to do is to set the lamp or the pot of burning sulphur in a tub in which there is a little water. This will make it safe against fire.

To make sulphur burn it is best to pour over it some wood alcohol to ignite it. The disinfector should not close the room until he can see the brownish liquid sulphur running over the surface, which will indicate that perfect combustion is taking place.

If sulphur is burned or used in the gaseous form from a cylinder it will be necessary to generate steam in the room, as sulphur dioxide has no effect on bacteria except in the presence of moisture. This is not generally known.

It is to be remembered that sprinkling with bichloride or carbolic acid solutions is not effective unless the entire surface or the whole fabric is thoroughly drenched. It must be further remembered that such a method is entirely useless in the presence of grease or oil on walls or floor.

Diseases that Require Special Disinfection.

None of these diseases is so hard to disinfect after as scarlet

fever. Some claim that nothing is effective but steam, but this is surely too extreme.

Forchheimer speaks of the difficulties in disinfecting after these cases and gives his method:

"In case the walls are papered, the paper is to be thoroughly rubbed off with dough to which there has been added a solution of corrosive sublimate. The masses of dough that fall off as the result of rubbing are to be carefully collected and then burned. Then a new coat of paper is to be put upon the wall so cleansed. This applies for the walls as well as the ceiling. In case both walls and ceilings are painted, the same process of rubbing is to be gone through with: this to be followed with a new coat of paint. . . . The floor is to be thoroughly scrubbed again with a solution of sublimate and soap and water, and if possible either to be painted freshly or varnished. All toys and books that have been used to amuse the patient must either be heated by boiling hot water to effect sterilization, or, if this is not possible, must be destroyed."

That the scarlet fever organism is very refractory to sterilization is certain; still it is thought the error has been in the use of gaseous disinfectants without sufficient moisture. If sulphur dioxide or formaldehyde are introduced into a room with sufficient watery vapor, sterilization will be complete, though an excess of disinfectants should be used and the exposure twice or three times as long. Here certainly the mattresses and pillows must be sterilized by steam, as the gaseous disinfectants will not penetrate deep enough.

Smallpox, like scarlet fever, is hard to disinfect, and the necessary details for one are effective for the other.

Rooms in which there have been tuberculous patients are very hard to disinfect. Coates has published some experiments this year which prove that the bacillus will survive for long periods in dust and dirt, and especially in greasy dirt. If there is a large percentage of oily matter deposited on the walls and floors of rooms, as there is nearly certain to be in the quarters of the poor, I know of no way to positively disinfect by a gaseous mixture. Soap and water and a thorough washing down, followed while still wet by an excessive amount of sulphur dioxide, and left exposed for days, is probably effective if the walls and wood-work are refinished afterward.

Soap and water should be used with all disinfections, especially on the floor. All woodwork should be revarnished and the room repapered or refinished.

The disinfection of school-rooms is to be done exactly as the sick-room, and it can be as effectively done, in just as short a time, as a small room. Disinfection can be started by five o'clock in the afternoon and the room be in use the next day. And if we take a room, say 20x50x14 feet, it can be disinfected with 90 pounds of sulphur for the sum of $2.70, and not more than two hours of labor by the janitor. In times of influenza epidemics it would seem wise to disinfect the rooms at least twice a week; and it is within the bounds of reason and prudence to compel theatres and places of amusement to disinfect their places once a week in the time of such epidemics. This plan has been adopted in a few foreign cities.

The Dust Nuisance.

In many of our great cities we have societies for the prevention of cruelty to children and animals, for the suppression of unnecessary noise, etc., but so far I know of none that has attempted to reform the dust nuisance. New York and several other cities have tried various methods of street cleaning to ascertain which raised the least amount of dust. Dividing one street up into sections, under certain individuals who are responsible to the inspectors, is the most effective method and the least objectionable. The individual broom method of sweeping up the droppings immediately does away with so much use of water to sprinkle and prevents the pulverizing and drying. Using the big street sweepers on wheels is altogether wrong, unless the street is kept constantly wet, otherwise the act of sprinkling, followed immediately by the sweeper, will stir up a cloud of dust.

Considering the dust raised by passing street cars, and vehicles and horses and people, and breathing the smoke and soot of cities like Pittsburg, Chicago and Cincinnati, it is little wonder that lung diseases comprise such a vast proportion of all our diseases and deaths. The pulmonary and bronchial lymph glands are essentially great scavengers that stand guarding our bodies from bacterial invasion. That they are pushed to their utmost capacity to perform this function is sure, and to give them the extra burden of arresting the foreign matter inhaled in dust, cannot but be disastrous in the end. Removing the consumptive, early in his disease, to a locality nearly free from all kinds of dust, will give him the best chance for recovery, principally because we have relieved his bronchial glands of this extra burden and have left them free to combat and arrest the onslaught of the tubercle bacillus.

Numerous experiments go to show that the number of bacteria in dust at the street level is many times greater than at the tops of high buildings; that the air in the city contains a very much greater proportion than the air of the country; and the air of the mountains less than at the sea level. The dust of certain portions of a city will show a much greater bacterial content than other sections.

Man is compelled to live exposed to his own filth, breathe his own contaminated breath in overcrowded city life; to meet his necessities the domestic animals have also been brought into the huddle and we must breathe their filth, their contaminated breath.

Get a Better Word Than Saprophyte.

What the causal relation of sickness and death in man is to sickness and death in domestic animals is a very great problem, and its importance is not yet appreciated. Aside from the many known and surmised relations between diseases of man and animals there is one interesting phase of the question having some bearing on this paper that has not attracted the attention of investigators as it should, and it is that if there are saprophytes and parasites on man's mucous membranes which, introduced into a proper medium, will cause sickness, it is but reasonable to believe that there may be saprophytes constantly present on the horse's nasal mucous membranes which, being ejected, desiccated and planted on our mucous membranes, might account for some of these mysterious sapræmic fevers which we have been unable to comprehend. It is more than likely that there are some kinds of parasites growing in the horse's nose, and it is not hard for one to see, in his imagination, during epizootic epidemics and other times, the millions upon millions of such bacteria blown out by these animals into the atmosphere, into the dust of the street, to be stirred up by moving masses of people, by horses and vehicles—and what is not stirred up by these is sure to be most effectively set adrift by that abomination, the street sweeper.

There is a great field for investigation, also, of the bacterial contents of the intestinal tract of the horse, and it is one that should be gone into very thoroughly.

In the meantime, let us unite in fighting for less dust and cleaner streets.

The Spitting Nuisance.

There is no more disgusting habit a man can have than spitting. One seldom sees a woman spit on the ground or floors—never a

lady, even a lady suffering with consumption. Man is indifferent to the æsthetic side of life and fails to pick up such little niceties; and being so much out of doors and having more colds than women, and using tobacco in some form, he gets into the habit of spitting on the ground, on the floor, in street cars, in churches, everywhere. And even when he must spit, common decency should prompt a man to step to the edge of the sidewalk and spit out into the street, so, at least, one would not have to walk in it. But he does not! He spits right down on the sidewalk; when walking with ladies, when meeting ladies, surrounded on all sides by ladies. Being on the street, this gentleman, this man, is so addicted to this habit that he fails to remember that he is a gentleman and that he is doing a dangerous thing. And yet this same gentleman will sit in his own house and smoke and never spit at all, because spittoons are barred in the houses of ladies and gentlemen. Here he remembers where he is and who he is. If he can refrain from spitting in his own home he can in the streets, in hotel corridors, in any place. And if he can not, or rather if he does not, it is only reasonable that the law reach out a firm hand and bring him to his senses.

When the Anti-spitting Law was enacted in New York we all can remember what a hue and cry was raised and how it was declared to be impracticable, but its success is most astonishing, especially on the street-cars and ferries. One will recall the disgusting ferries, especially as they were some years ago, and to see them as I did after four years' absence was a complete revelation. I myself had not believed it possible that the Board of Health could bring about such an improvement. I have noted some improvements in other cities.

One thing particularly attracted my attention in New York, and that was that in the elevated cars or their stations one saw very little spitting, and the simple explanation was that it was because smoking was not allowed and there were no spittoons to spit *at*. Let one walk right down from the elevated stations into the waiting-rooms of one of the ferries, say South Ferry, and immediately he will notice that each newcomer begins to fire up, so to speak, and the target practice at the spittoons commences, the range getting longer as the little sea of spittle widens out, compelling the contestants to move back to escape drowning. Man is much a creature of habit. If he sees a spittoon he naturally gets ready to give it a volley as he passes.

So long as we deal with the matter in a tentative manner and have spittoons, then just so long shall we have spitting. Spittoons are entirely unnecessary, and no one can point out any valid reason or argument for their existence. Attendants and cleaners place spittoons to collect the greater portion of the spittle. It is for no other reason, for these same cleaners take the spittoons out on the sidewalks or back yards to clean by spraying the hose into them, which washes the contents out onto the sidewalk or street. There can be no gain in that, surely.

I stand unqualifiedly for the complete discontinuance of spittoons in public places. A practical experience with a large number of men under the most unfavorable circumstances convinces me that spittoons are never necessary under any circumstances or conditions that can be named. A man has no right to commit a nuisance on a street, and it is clearly within the rights of municipalities to prevent spitting in the streets. It will be comparatively an easy matter to enforce such an ordinance if it be handled wisely and preceded by placarding and an anti-spitting campaign.

A Few Suggestions on General Prophylaxis.

Just recently a great hue and cry has been raised by the anti-vaccinationist because of the fact that a smallpox epidemic in Cleveland and another in an English city were wiped out by disinfection. I, for one, am rather glad this question should be stirred up, for it will tend to reawaken the interest in vaccination and disinfection. The anti-vaccinationist has never had any ground for his opposition, and he has seized onto this for something to talk about. Scientific sanitarians have been using both vaccination and disinfection for years, and it is nothing new, but their example has not been followed by the general practitioner as it should have been, and just here the decrier of vaccination serves us a good turn.

The perfect way to control smallpox is to vaccinate all exposed persons, and during an epidemic there should be a vaccination crusade. If complete isolation is then practiced with perfect disinfection (no foolishness), an outbreak will be promptly stamped out. It is truly a fact that our failure of entire success has been due to lack of disinfection, which leaves the disease in existence like a smouldering fire. Vaccination is one of the grandest preventive resources ever discovered, but its operation and field of applicability is necessarily limited: and it can never be perfect unless it goes hand in hand with scientific disinfection.

What is true of vaccination and smallpox is also true of diphtheria and the serum. Already there is a growing carelessness in the handling of these cases, because the frightful mortality has been so far reduced by anti-diphtheritic serum that the concentration of the physician's mind is rather to cure the existing case than, as formerly, to prevent its spread to others. This must not be, and the spread of these diseases must be prevented.

Sickness of any kind is certainly not a thing to be desired, and no child should be exposed for the purpose of *catching* one of these diseases, and if a physician finds a case he must stamp out the infected focus and not allow it to become epidemic. Even though it may be chickenpox or German measles, it should be prevented, because, if for no other reason, a mild sickness might lower the child's resistance temporarily and expose it to a greater danger. On the plains of the arid West a spark, if not stamped out, may leave vast destruction and ruin in its track. It may likewise happen with a *mild* attack of diphtheria, of smallpox, of scarlet fever.

The contention that these are respiratory diseases is not an individual idea or the concrete theory of any one man. Many will recognize in the paper their own positions and beliefs about the mode of infection and transmission of these diseases to others. To these I would say that it has been the endeavor to formulate their views and my views into a working hypothesis; to those with whom I shall run counter, it is the hope that their opposite beliefs may serve to concentrate their ideas into a rule of action which may help us to accomplish as good results in the future as we have in the past.

Preventive medicine has done wonders for the human race, and there is no greater example of its operation than the extraordinary increase in the world's population in the last hundred years. Without these great advancements of sanitary science in controlling the epidemics of the past such an increase would have been impossible and the world would have remained practically at a standstill. We look forward to the future with great hopes, for in the short course of ten years, in the registration districts of the United States, the average age at death has been changed from 31.1 years in 1890 to 35.2 in 1900, an actual gain of four years of life for each individual. These are the objective advantages of sanitary science, and these results have been brought about absolutely by attention to the simplest of details.

In the past our efforts have necessarily been directed to the control of the fulminant epidemical diseases, because these came so suddenly and caused terrible havoc in loss of life, but now that we have such wonderful results in controlling great epidemics, we should direct our attention to the insidious epidemic diseases—those that kill one here, there, so widely scattered that the march of the death rate is buried out of sight by being so widely disseminated. The control of these is the more hopeless task of the two, for with severe epidemics the public could be frightened into concerted action, while now our struggle must be slow and one for education. However hopeless it may seem, we shall, nevertheless, continue to struggle for the end—the ideal. Though often baffled, we need not be ashamed, for, standing upon the threshold of the twentieth century, medical man can look forward with faith in his profession to bring about results in the saving of life yet undreamed of; and turning, he can glance back into the dim vista of the past with that pride born of the consciousness of great achievement. Passing out of view, and we hope never to return, he will see the terrible plagues which in bygone times ran quickly over Europe and the world with such terrible results that whole cities and countries were nearly depopulated. While great wars for glory went on, he cannot but feel proud that he kept strictly to the field of science, working and studying and observing in the hope of finding some way of preventing these diseases. Through sickness and death, discouragements and ill-usage, he went on step by step, stopping this epidemic, controlling that, until now at the present day severe epidemics of any of the great plagues are things of the past.

We have seen the fever-infested ship cleared off the water routes of the world by simple disinfection; plague nearly controlled by cleanliness; smallpox shorn of its terrors by vaccination; yellow fever removed from the class of epidemic diseases by means of the mosquito net; and all this has come about in comparatively recent years by medical man's unselfish steadfastness in the pursuit of preventive medicine. Compare the deeds of other men, be they soldiers or statesmen or kings, and there is no achievement for the good of humanity that can compare with these.

Los Angeles, Cal., January 30, 1903.

WHAT MEDICAL INSPECTION MEANS IN NEW YORK SCHOOLS.

A DEVELOPMENT IN CO-OPERATION AMONG SCHOOL PHYSICIANS, SCHOOL NURSES, THE TRACHOMA HOSPITAL AND THE DISPENSARIES.

By LYDIA GARDINER CHACE,
Fellow of the College Settlements' Association.

Several years ago, New York made a beginning in the way of medical inspection in the schools. Realizing the dangers that arose from having children in school with contagious diseases, doctors were sent by the Board of Health, each morning, to the schoolhouses. Those pupils suspected by the teachers were brought before the physicians. The judgment of the teachers, therefore, determined whether or not the children should consult the medical inspectors, and thus the health of the schools rested largely with those who had no knowledge of disease, many of whom had but little interest in the matter. The system was so poorly developed that in some instances the doctors failed to make the daily visits.

Last fall the system of medical inspection was greatly improved. Now, each physician has a certain number of schools to visit daily, when, as formerly, the children thought to need his attention are sent to him. But, besides this, he goes to each class-room once a week, paying special attention to sore throats, to contagious diseases of the eyes, and to parasitic growths of the head and skin.

The result of the inauguration of the new method was that school-work in the early fall was generally upset, for it often happened in certain parts of the city that a third of the members of a class were sent out at one visit of the doctor.

What became of the excluded children? Some sought medical advice as they were told, and were able to return to school within a few days. Some wandered the streets, the little ones, because there was no one to go to the dispensary with them; the older ones, because an opportunity was given for playing truant.

Some parents did not know their children had been excluded, others complained that their boys were becoming ungovernable. They often declared there was nothing the matter with the children's eyes, would not have them treated, and demanded to have them readmitted. The children, in such cases, came back only to

be re-excluded. When the trouble is trachoma, a very contagious eye disease, and one that without treatment may result in blindness, the eye often appears normal to the inexperienced. One woman voiced the sentiment of many, when in her wrath, she said, pointing to her son's eyes: "He no bad eyes; he good eyes." And so it often happened that the children returned on the day specified on their cards in a worse state than they were when excluded. When asked for dispensary cards, those honest would say they had not been; those who wanted to avoid trouble, would say the card was at home, or none had been given them.

To illustrate: Max was sent out of school with trachoma; at certain intervals he returned, only to be re-excluded. Upon investigation, it was found he was not receiving treatment. His parents knew nothing of the matter. Twice a day for over a month, he started out with his books, and spent the day on the street.

Harry, also, was sent home with sore eyes; he enjoyed neither school nor doctors. During the next three months he returned at rare intervals, only to be re-excluded.

Gussie was excluded on September 11 for pediculosis. She returned for examination three or four times during the next three months, but was not readmitted until the second week in December.

These are perhaps extreme cases, but it often happened that a child lost four or five weeks of schooling when it really ought to have been absent not more than that number of days.

From September 12 to December 31, 12,647 children, in Manhattan, were excluded for contagious eye diseases, 8,994 for pediculosis, and 661 for contagious skin diseases.

The evil results of the exclusions were early apparent to those most interested in the welfare of the school children. The Board of Health and the Board of Education, with the aid of Miss Wald, of the Nurses' Settlement, formed a plan that has been of great help. Miss Wald offered the services of one of her nurses to go to certain schools each morning and treat those children whose conditions, if attended to, would not be a menace to the health of their companions. The nurse also visited some of the excluded children in their homes, giving the mothers directions or showing the need for a doctor's advice. The results of her work were so satisfactory after two months of trial, that at the beginning of December five nurses were employed by the Board of Health to work in cooperation with the school physicians. At present there are sixteen nurses working in sixty-three schools in Manhattan, nine in Brook-

lyn, and two in the Bronx, with a supervisor, Miss Rogers, of the Nurses' Settlement.

At the present time, the code for exclusions is:

1. Diphtheria.
2. Scarlet fever.
3. Measles.
4. Varicella.
5. Pertussis.
6. Pediculosis.
7. Trachoma.
8. Acute conjunctivitis.
9. Scabies.
10. Ringworm.
11. Impetigo.
12. Tonsillitis.
13. Mumps.
14. Favus.
15. Molluscum contagiosum.

The aim of the Board of Health is to prevent exclusions and to get those children who have been excluded back into school. The nurses do not bind up fingers nor treat burns, they simply tend to those children who are sent to them by the school physicians, children who have conjunctivitis, pediculosis, and contagious skin affections.

As a matter of fact, children are no longer excluded for the minor contagious troubles, but are first ordered under treatment; if they do not carry out the directions, they are then sent from school. Those who do not return at the time specified on their exclusion cards, are visited by the nurses in their homes. Thus, children can no longer become truants without the knowledge of their parents. During January the nurses cared for 13,193 cases in the schools of Manhattan and visited 540 houses; during February, 11,169 cases in the schools, and visited 679 houses.

The number of children excluded for contagious eye trouble was so large that the dispensaries could not adequately meet the increase in work. In December, therefore, the Board of Health began the treatment of the trachoma cases; two wards, an operating-room, and a dispensary in old Gouverneur Hospital were fitted up for the purpose. The statistics for six weeks of the cases

Date.	*Old.*	*New.*	*Operations.*	*Total.*
February 7	1,684	546	139	2,369
February 14	1,722	475	110	2,307
February 21	1,518	554	138	2,210
February 28	1,960	585	108	2,653
March 7	2,473	1,090	149	3,712
March 14	3,127	1,005	143	4,275

treated there show that the medical inspection of the schools is no longer a mere "formality."

In the fall the Board of Health simply excluded children from school without making any provision for their treatment. Now, with the school nurses, the trachoma hospital and the regular dispensaries, if the children are not cared for, the responsibility rests with the parents, not with the city.—"Charities," April 25, 1903

THE REAL VALUE OF VACCINATION.

The London "Lancet" of July 5, 1902, contains an excellent summary of our knowledge of this important topic. A particularly notable part of the symposium is that which deals with the production of immunity by vaccination. After detailing an immense amount of facts pointing to the great value of this method, one of the articles concludes by the remark that the obvious commonsense view to take of the question of immunity is to accept the main facts, which have proved the immunizing power of vaccination beyond any doubt; to regard the exceptional cases with interest, but to wait for their explanation until we receive further enlightenment, which is more likely to come from the scientific laboratory than from clinical observation; and, in the meantime, not to distort their significance. In regard to the choice of lymph the question arises, Can glycerinated animal lymph, provided it be good of its kind, be relied upon to prove as efficient as any other kind of lymph? The answer to this question may be unhesitatingly made in the affirmative. There are, it is true, practitioners who still have their doubts about it; that is only natural, because the time since arm-to-arm vaccination has been superseded in England is not very long, and people who have always obtained good results with the old method may be expected to adopt a critical attitude toward the present innovation and regard it as still on its trial. If, however, a fair consideration be given to the results obtained from glycerinated calf-lymph both in Germany and America, as well as in England, it seems impossible to escape the conclusion that this form of lymph has already passed beyond the period of probation, and fully proved itself capable of producing typical vaccinia and protecting people who are brought into immediate contact with cases of smallpox. There seems no reason to suppose that lymph from the calf may not be as good as lymph from a child, nor has any objection to the use of glycerin been established which in any degree counterbalances its advantage as a purifying agent.

We may give a typical example of the sort of agitation in a

small way which is got up from time to time against the use of glycerinated lymph. A number of physicians, in the United States for instance, vaccinate with glycerinated lymph and find it produces local reactions, and in some cases what appear to be vaccine vesicles. Then to their dismay they find that if the persons so treated are vaccinated a short time afterward with dry points a large number of them "take" in quite unmistakable fashion. The inference is inevitable that the glycerinated material used was ineffective, and a presumption is raised against the utility of glycerinated lymph in general. Whereupon some well known authority generally comes forward and makes clear the real nature of the difficulty. Thus, in the case alluded to, Welch and Schamberg write: "Our experience with glycerinated lymph at the Municipal Hospital has been quite different from that above quoted. It has been employed to the exclusion of all other forms of virus." They go on to show that the results obtained with it on nurses and other persons employed in the smallpox hospital completely established its thorough efficiency. Then they add, which of course gives the key to the whole mystery, that the lymph which they used was not, however, obtained from the same sources as the glycerinated lymph which other physicians found ineffective. That bad glycerinated lymph makes its appearance from time to time no one denies, and any agitation which would tend to eliminate it would serve a useful purpose; but a moment's consideration will reveal the unfairness of concluding from the badness of particular samples that the genuine article has not yet fully established its merits.

Upon the question as to what antiseptic precautions the vaccinator ought to take in performing his operation, and in the subsequent treatment of the wound, there is every variety of opinion. At the one extreme we have those who hold that the treatment ought to be conducted with all the rigidity of asepsis which characterizes an important surgical operation; at the other end of the scale are those who believe that, provided we have good lymph and a clean instrument, we need not trouble about any danger of extraneous contamination; and then there is a large intermediary class who find contentment in the elasticity of the phrase, "with all precautions possible."

Ideally speaking, the routine would be—make the inoculation site absolutely sterile; remove all traces of disinfectant with sterilized water or absolute alcohol; apply aseptic dressings after the operation so as to exclude the entrance of extraneous organisms; and in the stage of discharge keep the dressing clean by constant renewal.

It is not part of the purpose of the present article to consider how many vaccinators actually adhere to such rules as these, or how far others may deviate from them. They are better entitled to speak for themselves on that matter. But there are certain possible difficulties which may be pointed out as apparently standing in the way of strict asepsis. There is, in the first place, the question of time. The waiting-room may be crowded with patients waiting to be vaccinated, and the operator may know that he ought to work at the rate of about thirty an hour in order to get through his daily task. In such a case, unless he has several attendants to do the cleansing for him, it must be very difficult to adhere to the principle of strict aseptic surgery. Again, his subsequent inspection of the patient will probably be limited to a single visit a week later, which seems hardly enough to satisfy the requirements of the aseptic theory of treatment. Supposing the arm to be really sterile at the time of inoculation, a clean dressing carefully applied ought to be a satisfactory protection for some days. But if there are numerous bacteria left at the site of inoculation, the additional warmth of the protective covering applied will probably only tend to foster their growth. Again, in the stage of discharge, if the dressing as soon as it becomes soaked is replaced by a clean one, well and good; but if it is left on until it becomes purulent and filthy, it will simply degenerate into a bacterial hotbed, and, as by this time it has probably worked loose, bacteria from outside will make their way in, and will find in this unpleasant mess greater facility for luxuriant growth than if the wound were unprotected. It must thus be a very difficult task for the vaccinator who insists on the importance of thorough asepsis always to carry out his treatment to his own satisfaction.

With regard to the view that cleansing of the arm and protective dressings are unnecessary, the practical consequences of disregarding such precautions will probably vary with the class of patients dealt with. With a patient of thoroughly cleanly habits the chances of any harm resulting are, no doubt, very slight indeed; but with a careless subject, and still more with a person engaged in a dirty or dusty occupation, the risk is certainly appreciable.

The intermediate principle of taking "all precautions possible" may perhaps be interpreted as meaning that the methods adopted must be adjusted to the condition of the patient. Thus we may imagine that the amount of cleansing performed will vary according to circumstances, from the application of warm water merely to soap and water, alcohol, carbolic acid, and finally to thorough

surgical sterilization, and that, though protective dressings will be applied or ordered when thought desirable, they will not, as a matter of routine, be sealed down with strapping, with strict injunctions that, filthy or not filthy, the patient must on no account disturb them for a week.

From a survey of the possible contingencies we have mentioned, it appears to follow that in the general question of vaccination asepsis there is great scope for individuality of judgment.

SANITATION IN EGYPT.

From "The Medical Record."

Egypt has had a short season this year, and by no means a full one. The causes are not far to seek. The Delhi durbar undoubtedly took many English people to India, who would otherwise have come to Egypt, but the event most instrumental in keeping people away was the existence of cholera here last summer and autumn. Cholera was present throughout the entire Nile valley, as far south as Wady Halfa, the pathway to the Soudan. That the Soudan Sanitary Department was able to keep it out of the Soudan testifies highly not only to the efficiency of the Soudan Sanitary Department, but to the authority of the Soudan Government over the Soudanese. The Egyptian does not take kindly to sanitary regulations. He is ultra-conservative and scorns innovations. His fatalism not only makes him feel that sanitary measures are useless, but in addition he fears he may merit Allah's displeasure, by attempting to go counter to his will. For this reason the strongest precautionary notices to the natives are of no use whatever. The only way to make them observe preventive measures is to render it impossible for them to disobey them. If a water supply is infected it must be obliterated or rendered impossible of access. Wells and pools must be filled up, or if the latter are too large, they must be patrolled. On more than one occasion during the cholera epidemic it was found necessary to destroy all the vessels used for water in a town or district which was infected. There is no doubt but that cholera is endemic in Egypt. An epidemic, therefore, does not depend so much on the presence of the bacillus as upon its degree of virulence. It was observed in the epidemic last summer, to which 40,000 succumbed, that in the beginning the death rate was rapid and frightful. Cases often died within two or three hours of the first symptoms. As time went on the type became milder and the mortality was not nearly so high. So

it would seem that, while vigorous and thorough preventive measures are of the greatest service, there are also natural causes at work which materially aid in suppressing an epidemic. The most stringent sanitary precautions are being taken in regard to the pilgrimage to Mecca this year, and it is confidently believed that any cholera which may occur can be kept in hand. Of the 40,000 cases which died last summer and autumn, very few were Europeans. Egypt receives the scum from the European shores of the Mediterranean, and the cholera cases among Europeans were practically all from this class.

Cholera is very largely a disease of filth and ignorance. The tourist has very little to fear from it. The disease he has reason to fear is typhoid fever, which does not confine itself to the lower classes, but, as we learn from the newspapers, frequently invades the royal palaces. Everyone knows people who have contracted typhoid fever while traveling in Europe. Cairo is little, if any, worse than the cities of southern Europe. The laity are all careful nowadays about the water they drink, but most people take cold milk in their tea and milk in their coffee which is probably just a little above incubation temperature. In addition to this—in the writer's opinion—butter is deserving of greater suspicion as a source of infection than is usually accorded it. In contradistinction to one's home, in every hotel the food which one eats must necessarily go through a great many hands, and certainly, therefore, be more liable to convey infection.

The Egyptian Medical Congress, which was held in December, proved a highly satisfactory scientific meeting, not only to the resident members, but to the visitors as well. The volume of transactions is in course of preparation, of which each member will receive a copy, and in addition a medal which the Khedive will have struck in commemoration of the event. The next Congress will be held three years hence, and my confrères who want a pleasant and profitable holiday will do well to bear the date in mind.

I am yours, etc., C. G. CAMPBELL.

Cairo, March 5, 1903.

RECLAMATION OF THE PONTINE MARSHES.

The "Nachrichten für Handel und Industrie," of Berlin, has the following:

For many years the draining and agricultural recovery of the Pontine marshes has been a question of the liveliest interest in Italy. The term "marsh" is not quite correct as applied to this

land, as it is only in the rainy season that the swollen mountain streams overflow the broad, deep canals, and, finding no other outlet, cover the surrounding low grounds and form marshes. At the close of winter, these grounds are quickly dried by the sun. The surface exposed to these floods is estimated at 16,000 hectares (39,536 acres), while the entire Pontine marsh has an area of 200,000 hectares (494,200 acres). In the spring, the whole country is a sea of flowers; the lands which only a short time before formed the so-called marshes, are now planted with maize, which grows with marvelous luxuriance. For this reason the owners of these lands regard with dissatisfaction the intended diversion of the mountain waters. The entire tract of land is extraordinarily fertile and productive, but malaria casts a deep shadow over it. The evaporating waters and the marshy ground along the canals engender innumerable mosquitoes and deadly fever. From June until late autumn the country is practically uninhabitable, and only a few resident tenants are to be found. Through the building of the Velletri-Terracina Railway, the Appian Way, which cuts in a straight line through the entire tract, has become completely depopulated. One can now travel 31 miles over the road without meeting a human being. To remedy this condition of things, the Italian Government passed a law in 1899 which obliged the owners of the ground to carry out the following works:

1. Diversion of the mountain waters.
2. Regulation of the mountain streams in the hills.
3. Cleansing of existing canals.
4. Draining of the submerged lands either by producing a natural outlet or by mechanical aid.

The Government engineer has perfected the necessary plans for the draining and agricultural recovery of these lands. The works are to be distributed over a period of twenty-four years, and 7,000,000 lire ($1,351,000) was appropriated for the cost. In this slow work a large part of the appropriation must necessarily be absorbed by the cost of administration and incidental expenditures.—Consular Reports.

BITUMINOUS MACADAM PAVEMENT.

In a paper read by Mr. C. A. Kenyon at the convention of the Indiana Engineering Society ("American Gaslight Journal," February 9, 1903), the name bituminous macadam was selected

by the inventor for a pavement of broken stone mixed with bituminous cement. It combines the good qualities of macadam with the best qualities of the asphalt pavement. It eliminates the bad qualities of the asphalt, as well as the bad features of macadam, and yet it is a stone pavement. Every engineer knows that a very good pavement can be built of broken stone without any cementing material. The coarse, angular pieces of stone, when submitted to heavy pressure, fit and wedge themselves together in such a way that the resultant mass will bear great loads. The mass thus laid will have, with 3-inch stone, from 40 to 45 per cent. of voids. These voids, while not uniform in size, will be large compared with the voids in ½-inch stone.

Rains and water ravel and wash macadam badly, so that tons of the road metal go into the sewers, or are washed away by each storm. Water goes through it and softens the foundation, and it loses its grade. The fine metal on the surface mixes into a pasty mud. In dry weather that mud becomes dust, high winds blow it off the road, and it must be replaced at great cost. Such a pavement must be sprinkled. It is costly to clean because the economical sweeping machine cannot be used, and so it must be cleaned by hand. It is costly to maintain.

Mr. Frederick J. Warren sought experimentally to discover a pavement which would combine the best qualities of macadam and sheet asphalt. He took a cubic foot of solid stone, fitted a box over it, weighed the stone, and then broke it into pieces about 2 inches in diameter, attempted to replace all the stone in the box, and but little more than one-half in volume or weight would go back into the box. He undertook the task of so breaking and arranging the sizes of that remaining out of the box, that he could place it all back into the box. While he did not put all of it back in the box, he did put 90 per cent. of it back, and discovered and formulated the principle whereby, with predetermined proportions, he can accomplish practically the same results every time. After discovering a way to reduce the voids in a mixture of stone to 10 per cent., the work was not finished. In order to accomplish a useful result it was necessary to find a way to get that compact mass of stone into a pavement surface, and keep it there. It was finally decided that a bituminous cement of great uniformity and durability in all temperatures, one that should be absolutely unaffected by water, and one with great cementing strength, was necessary. The result was the Puritan brands of bituminous cements. Of course this had to be followed by the devising of

appropriate bins, screens, mixers, heaters and machinery for the manufacture and laying of the pavement.

The pavement is constructed with from 4 to 6 inches of 2½-inch to 3-inch crushed hard stone foundation, laid on a thoroughly compacted subgrade. This foundation is thoroughly compacted by a 15-ton road roller and brought to a true surface. Hot bituminous cement is then poured over the surface so that it will run into the interstices, thus binding it together and making it waterproof. Many engineers favor this form of foundation in preference to hydraulic cement concrete, which is pervious to water, and has not the advantage of having been wedged into place by the use of a heavy roller. The concrete foundation for any pavement is of recent origin; the first one used in London was in 1872. On top of this foundation is placed the wearing surface. The broken stone is heated in revolving drums to about 200° F., and then, by carefully arranged screens, sorted into sizes and deposited into separate bins. From each of these bins can be drawn the exact amount of the particular size required, the aggregate of which corresponds to the result of the experiments, and when compressed in a mass, approaches to 90 per cent. of a solid stone. This aggregate is then put into a revolving mechanical miner and the heated bituminous cement, by exact weight, poured in, and the mixing continued until every piece of stone, from the largest to the finest powder, is covered with a thin waterproof coating of the bituminous cement. It is then dumped into a wagon, hauled to and deposited in a layer on the foundation prepared as above described, and then rolled with a 15-ton road roller.

The result is practically a solid road. It is rigid because the large, angular stones in the mass are wedged together. These large stones thus wedged would bear the weight of any load likely to be hauled over them, without the use of cementing material. It is therefore not necessary, as in the construction of an asphalt pavement, which is sand mixed with bituminous cement, to have the cement so stiff or hard that under all atmospheric conditions the cement is strong enough to hold the grains of sand in a column. The sand without the cement, no matter how arranged, will not bear any load.

The advantages claimed for this kind of pavement may be summed up as follows: The smaller materials fill the voids in the larger materials, thus giving great density; the bituminous cement makes the pavement absolutely waterproof; the bituminous cement holds the fine material in the interstices, preventing it from

shifting or going to the bottom as in the ordinary macadam, and also preventing the pavement from rolling into waves; the cement forms a cushion between the stones and prevents them from rubbing against one another, thus making the pavement elastic and quiet; in such a dense and rigid mixture, the exposure of the cementing material is reduced to a minimum, permitting the use of a softer bituminous cement, which will retain its cementing property much longer in this form of pavement than cements will in the asphalt or sand mixtures, giving greater durability to the pavement; being waterproof, homogeneous and dense, rain and water cannot wash, or wind blow, any part of it away; it can be flushed with water for cleaning, or swept with a sweeping machine; since the surface is slightly indented by the laying of the stones, a flush coat of quick-drying cement is poured on or squeezed into these indentations, and fine sand and screenings are spread over the surface and rolled in with the heavy roller, by which means, while the pavement has a surface for the wheels equal to asphalt, it provides a foothold for horses equal to macadam.

The question of cost is difficult to answer without knowing the conditions, cost of stone, labor, size of contract, etc. It is not advocated as a cheap pavement, but on account of its great excellence. Last year there was laid and contracted for, in over forty cities, from Boston to Seattle, over 640,000 square yards of bituminous macadam pavement.

NEW FOOD PLANTS IN YUCATAN.

The gardens and fields of Yucatan are filled with succulent vegetables and odorous herbs unknown to the outer world. In the cultivated fields, at the proper seasons, are grown classes of indian corn, beans, squashes, and tubers for which we have no name, for the reason that we have never seen or heard of them.

The forests and jungles contain fruits that, excellent even in their wild state, could be made delicious by scientific care and cultivation. There are half a score of wild fruits that offer more promising results than did the bitter wild almond, the progenitor of the peach.

It is my purpose to bring to notice these promising subjects for cultivation in a series of reports made with the object of attracting the attention of those interested in this line of research and practical work.

The writer holds himself in readiness to supply any person who, or society which, desires the seeds or roots mentioned in these reports for the purpose of study, making only such charges as will cover the actual expense incurred.

The most important of the large cereals is the maize of the Mexicans—the indian corn of the Americans, and the ixim of the Mayas of Yucatan. Like several other vegetable products, its origin as a cultivated plant is enveloped in obscurity, the wild plant from which it was evolved not yet having been identified. Many believe that the cultivated plant was born somewhere between Yucatan and the tableland of Mexico. The mother plant was probably a grass, and the new grain spread to all sections, each one giving it certain characteristics, until the varieties grown in the North hardly seem related to those of the southern lands.

Yucatan has six varieties of this grain, and the Maya Indian reverently speaks of it as the "grace of God."

The large-stalked, large-grained class known to the natives as xnuc nal (pronounced shnook nál) is the most prominent and has by far the greater acreage devoted to its cultivation on the peninsula (Yucatan). It is planted in May, and when matured is left to harden and season until gathered as needed. This class most nearly resembles our indian corn. It has both the white and yellow grains. Under the haphazard methods of the native Indians, the corn produces in the limestone soil of Yucatan from 20 to 30 bushels to the acre. Under favorable conditions, this yield is often doubled.

The "xmehenal" (shmehenál) is a small, quick-growing variety, about the size of our pop corn. The plants are rarely 4 feet high, and the natives have a saying that the cock can pick the flowers of the true xmehenal without stepping off the ground. One variety matures within sixty days of its planting, and the second needs but fifteen days more.

The xmehenal xtup (shtoop), planted in May, can be gathered in July, and, while the production per acre does not quite reach the figures of the xnuc nal, it has a greater capacity of resisting the extremes of heat and dryness.

The natives of Yucatan prefer the native corn to that imported from the United States, and will cheerfully pay the higher price demanded in times of scarcity. They state that our method of kiln drying injures the grain. They allow the grain to harden and dry slowly in the ear upon the stalk.

The plant, or rather the running vine known as the macal box

(makal bosh), produces a tuberous root of great nutritive value. Entire families have lived upon this root for weeks at a time and were healthy and well nourished. This plant is very productive. About the middle of May the green shoots first appear above the earth. They grow rapidly and in November are ready to be dug. The tuber is about the size of a large Irish potato and is of a purplish color, like a certain class of sweet potato. It can be cooked in the same way as the sweet potato. The plant is hardy. A long drought may cause the vine to wither, but with the lightest rain it springs up anew. The roots left in the ground as too small for food propagate the plant, and each year the yield increases. It seems to be a kind of native yam; it grows in almost any kind of moderately rich soil, and when cultivated intelligently should be of certain value as a food. The xmakin macal (shmakeén makál), like the macal box, appears in May and is gathered in November, but it yields only one or two tubers to the plant. These, however, are of large size, resembling enormous Irish potatoes. I have seen four of these great roots fill a bushel basket. The interior is white and seems to be nearly pure starch. It is planted as we set out potatoes. The plants grow close together, and, while I have no exact figures, the yield per acre should be phenomenal, so far as weight of product is concerned.

Xmehen chi-can (shmehen chi kan) seems to be a kind of artichoke, weighing when mature about a pound. The plants are running vines, rarely more than a yard long. An acre will yield an immense crop under favorable conditions. The plant, sown in August, can be gathered in November.

Xnuc chi-can is a larger root, weighing when mature about 3 pounds. It is a hardy plant and produces well. Both of these roots are eaten roasted or boiled, and many like them raw. Some of the roots sent with this report as specimens are not of the sizes given, as they have been by force of circumstances taken out of season.

EDWARD H. THOMPSON, *Consul.*

Progreso, August 3, 1902.

THE HAPPY LONG ISLANDER.

We have people on Long Island who are impervious to mosquito bites. Their skins are so pickled in whisky, or something, that culex and anopheles have no terrors for them. On the contrary, they are a terror to culex and anopheles.—"The Brooklyn Eagle."

EDITOR'S TABLE.

SANITARIAN, JUNE, 1903.

Embarrassment incidental to the death of the intended manager, under the new business arrangements, announced in October number, delays the completion of the organization. Meanwhile:

All Communications, business and otherwise, all exchanges and all publications for review, should be addressed to the Editor, as heretofore: Dr. A. N. Bell, 337 Clinton Street, Brooklyn, N. Y.

THE SMALLPOX GERM.

At a meeting of the Boston Society of Medical Sciences, held April 28, at the Harvard Medical School, Dr. W. T. Councilman announced the discovery of the probable etiology of smallpox. From the process of investigation leading up to the discovery, as described in the "Boston Medical and Surgical Journal," April 30, 1903, it appears that bodies of uncertain origin and significance, for upward of ten years, have been observed in the epithelial cells of the skin in cases of smallpox. These bodies have been demonstrated to be organisms, belonging to the group of protozoa, and further, that they have a definite life cycle, both without and within the nuclei of the deeper layer of epithelial cells of the skin. Smallpox passes through certain perfectly definite stages in its development on the clinical side, to which correspond equally definite changes in the form of the causative organism; that these changes in form consist first in the appearance in the cell protoplasm of small, homogeneously staining, structureless bodies, about one micron in diameter, not staining so deeply as nuclei, which gradually increase in size, coincidentally with the degeneration of the cells in which they lie; that with this increase in size the character of these bodies changes, small granules surrounded by circles appear in them, the general outline becomes irregular, with increasing resemblance to an ameba; that a process resembling sporulation takes place with the breaking up of the ameboid forms into smaller, sporelike bodies; and that this constitutes the first cycle in the life of the organism. Up to this period the nuclei of the epithelial cells show no changes whatever, but the following alterations in these structures now appear: penetration of nuclei by the small sporelike bodies before spoken of, with the disappearance of such bodies from the cell protoplasm; small ring-shaped bodies become apparent in the nuclei; they also increase in

size; the ring shape is at first preserved, which is soon surrounded by a spongelike body. This whole structure grows, fills and finally destroys the nuclei, and the bodies become free; the bodies again become more homogeneous; ring-shaped bodies again become evident; finally each ring appears to have a central dot. These final bodies are regarded as the infecting agent of the disease. Two cycles of the organism, corresponding in general to what we know of the protozoa, have therefore been demonstrated: the first—extranuclear—simple, and the second—intranuclear—very probably sexual.

It also appears to be demonstrated by this work that vaccinia represents the extranuclear phase of the organism, but that the production of true smallpox is dependent upon the invasion of the nuclei—the intranuclear cycle. Vaccinia may be produced by inoculation, for example, in the calf or the rabbit; variola under similar conditions is produced in the monkey. This, also, Dr. Councilman and his colleagues have shown. The organism was found in the blood in one case. The difficulties of study are very greatly increased by the extreme rapidity with which the entire process takes place and by the ease with which the organisms are destroyed; the life history is completed with the formation of the vesicle, hence the absolute necessity of securing early and perfectly fresh material. The rôle of bacteria is regarded as entirely subordinate to the organism described, though the influence, particularly of streptococci, must be taken into consideration in the development of the disease.

Dr. Councilman expressed the opinion with confidence, that the organism which he described belonging to the protozoa was the essential etiological factor in the production of smallpox. This opinion received confirmation from the apparently conclusive lantern-slide demonstration, illustrating phases in the life history of the organism, and also from the testimony of Prof. G. N. Calkins of Columbia University, who was present, and who had previously identified certain of the ameboid forms as unquestionably protozoa. Professor Calkins' recognized knowledge of the protozoa adds weight to the statement he made at the meeting, that "there is absolutely no doubt that we have to do in the process with an organism which belongs to the protozoa."

It requires no stretch of the imagination to see in this work of Dr. Councilman and his assistants a discovery of the most far-reaching significance. If it stand the test of criticism, which will forthwith be turned upon it from all parts of the world, it must

unquestionably be regarded as one of the great medical discoveries. If, in the future, it requires modification, it will still stand as an investigation of vital importance for having directed attention to the probably great significance of the protozoa in the production of diseases, for example, the exanthemata, which have hitherto wholly eluded the most painstaking research.

SANITATION AND BETTER DWELLINGS.

At a recent meeting of the American Institute of Social Service Mr. Robert Garrett was appointed a member of the American committee which is to co-operate with the sociological workers of other countries in the International Housing Congress, to be held in Paris, from July to November next, at the Grand Palace in the Champs Elysées. The Congress is to take place under the patronage of the French Government, with a special regard to the importance of inaugurating preventive measures against the spread of tuberculosis and alcoholism. The chief work of the American committee will be the preparation of an exhibit of data as to what has been done to solve the housing problem in this country, with copies of laws passed in various States, models of improved tenements, etc. Richard Watson Gilder, of New York, editor of the "Century," is the chairman of the committee, and the other members are Albert Shaw, New York; Carroll D. Wright, Washington; Stanley McCormick, Chicago; Robert Garrett, Baltimore; Talcott Williams, Philadelphia; M. E. Ingalls, Cincinnati; William B. Howland, Dr. E. R. L. Gould and J. H. Hyde, New York. The official announcement of the congress says among other things:

"The two great diseases that menace the future lives of the race —tuberculosis and alcoholism—have their origin for the most part in the unhealthy and pitiable lodgings of the workingmen.

"This question of improved dwellings touches all problems that concern the comfort and the hygiene of cities—cleanliness, sanitation, purity of water supply, systems of drainage, facilities of traffic. It is not merely a few citizens who are demanding such reforms; the public generally see their need. We are living according to past traditions—imperfect and inadequate for our times. While this order of things continues, little can be accomplished.

"What is now needed to advance this question of housing is a practical demonstration. This exhibition will be aided by some of the most prominent men of the day, and the exhibits will be

most important in arousing public interest in the amelioration of the condition of the workingman and the general well-being."

WHAT CONSTITUTES "SOUND HEALTH."

In the case of Packard vs. Metropolitan Insurance Company the policy sued on contained a provision "that no obligation is assumed by the company prior to the date hereof, nor unless on said date the insured is alive and in sound health." The Supreme Court of New Hampshire says that it must be presumed that the parties intended by this provision what the words used by them ordinarily signify in common speech. What was meant by the words "sound health" was, evidently, not perfect health. "We are all born with the seeds of mortality in us." No definition can be given to these words that will apply in all cases. A mere temporary indisposition or ailment would not ordinarily be regarded as rendering the health unsound, within the meaning of these words when used in an insurance contract. Speaking generally, they mean the absence of any vice in the constitution, and of any disease of a serious nature, that have a direct tendency to shorten life; the absence of a condition of health that is commonly regarded as disease, in contradistinction to a temporary ailment or indisposition. Whether, in a given case, a person is of sound health, must, of course, depend on the circumstances of the case. The insured in this case was a boy of 10 years of age. After he was examined by the company's physician, and before the date of the policy, he "fell sick of a disease of the heart," from which he died within six months. Although the disease was one which it was said was not infrequent among children, and is frequently outgrown, it could not reasonably, the court says, be regarded as a temporary ailment, or as not of a serious nature. A person having such a disease would not be regarded as in sound health. The fact that the boy's mother, who was suing, was not aware of the nature of the disease, and that its nature was undiscoverable except by a physician, did not prevent it from rendering the boy's health unsound. Undoubtedly, the testimony of the mother and others that the boy appeared to be in good health would be competent evidence on the issue of soundness, but it would not be conclusive. The testimony of physicians concerning the condition of his health, discovered by their examinations of him, would also be competent. If the boy was sick with consumption at the date of the policy, no one would say that he was in sound health.

MORTALITY AND MORBIDITY REPORTS AND REVIEWS.

NEW YORK.—The State is divided into Sanitary districts as follows: *Maritime District:* Includes New York, Brooklyn, Long Island, Staten Island and Westchester County. *Hudson Valley District:* All the counties on either side of the Hudson River, except Westchester, to and including Albany and Rensselaer. *Adirondack and Northern District:* The northern section of the State—the counties of Washington, Warren, Hamilton, Essex, Clinton, Franklin, St. Lawrence, Jefferson and Lewis. *Mohawk Valley District:* Schenectady, Schoharie, Saratoga, Montgomery, Fulton, Herkimer and Oneida counties. *Southern Tier District:* The seven counties along the southeast border of the State. *East Central District:* Sullivan, Delaware, Otsego, Madison, Chenango, Onondaga and Cortland counties. *West Central District:* Cayuga, Tompkins, Seneca, Schuyler, Ontario, Yates, Livingston, Genesee and Wyoming counties. *Lake Ontario and Western District:* Oswego, Wayne, Monroe, Orleans, Niagara and Erie counties.—Bulletin for March, 1903:

Districts.	Population.	Total number of deaths.	Death rate per 1,000 pop'n of—all causes.	Deaths under five years.	Zymotics per 1,000 —all causes.	Typhoid fever.	Croup and Diphtheria.	Diarrhœal diseases.	Consumption.	Pneumonia.	Cancer.
Maritime	4,052,875	6,539	18.9	30.0	10.0	7	32	25	120	126	250
Hudson Valley	696,000	1,100	18.6	17.3	7.5	18	8	9	115	106	44
Adiron. & Northern	394,772	514	15.5	17.6	5.5	27	6	8	108	102	28
Mohawk Valley	420,000	607	16.6	17.6	6.0	14	15	9	103	73	25
Southern Tier	429,530	584	16.0	13.1	5.4	23	5	2	54	97	36
East Central	403,000	600	17.4	17.2	6.7	19	8	10	100	99	21
West Central	320,600	490	18.0	12.6	5.0	36	0	6	80	110	22
Lake Ont. & Western.	893,819	1,213	16.0	26.0	8.6	18	9	24	90	73	52
Entire State	7,910,600	11,651	17.5	25.7	6.2	13	22	19	108	111	478
City of New York	3,732,903	6,084	19.2	18.30	10.0	42	105	157	734	1,286	235
Bor. of Manhattan	1,917,676	3,490	21.1	11.02	3.5	18	105	98	389	778	141
Bor. of the Bronx	268,341	422	18.5	10.5	15.4	1	19	6	105	62	12
Bor. of Brooklyn	1,219,597	1,898	17.3	5.34	8.3	20	76	44	206	391	71
Bor. of Queens	182,681	216	13.8	6.7	13.0	2	8	4	15	41	7
Bor. of Richmond	72,608	108	17.5	2.2	8.5	1	1	5	19	14	4

Site for Consumptives' Camp.—It is gratifying to notice that, at a recent meeting of the Board of Health, the long-entertained

fallacy that high altitudes are specially desirable for the care of consumptives has been abandoned. President Lederle announced that he had decided to establish the tuberculosis camp on North Brother Island. Efforts to make a selection from localities up the State met with opposition from those living in the neighborhood. Experts have examined the atmospheric conditions of the site and reported that it is suitable for such a camp. The same may be said of many places in the pine woods of Long Island. They are in no respect less, and in several respects more, favorable for consumptives than the Adirondacks.

The population of New York City is increasing at a remarkably rapid rate. The birth rate is now 5 per cent. higher than the death rate, and a large proportion of the phenomenal immigration which has been coming to New York of late remains there. The population of the city is now estimated by the Board of Health at 3,732,903, a gain of nearly 300,000 in the three years since the census was taken. Of this gain 67,583 has been in Manhattan, 68,000 in the Bronx, 125,000 in Brooklyn, nearly 40,000 in Queens, and 5,587 in Richmond.

CONNECTICUT.—Annual report of the State Board of Health for 1902, together with the Registration Report of the Bureau of Vital Statistics for 1901, pp. 280-276.—Marked and creditable increase in public interest in hygiene, as well as increased activity and co-operation of the local health officers with the State Board, throughout the State, are felicitously expressed in the general report of the Board, as most encouraging conditions. The most notable fact dwelt upon relating to the health of the State for the year was the prevalence of smallpox, due to the negligence of vaccination—well shown by the exemption of communities where vaccination had been carefully practised. For example, in Thompson, a small town in which vaccination had been long neglected, there were 40 cases. While in three of the largest cities in the State, New Haven, Hartford and Bridgeport, where the people generally were vaccinated, there were but 16 cases all told, and these were nearly all imported.—Next follows the consideration of other communicable diseases—measles, scarlet fever, diphtheria, whooping cough, and typhoid fever—for the spread of which health officers are in a measure responsible. And with regard to the prevalence of these, too, there are striking citations of unmistakable conditions.—The mortality from these diseases and the average for ten years previous:

	Sept. 1, 1901-*Sept.* 1, 1902.	1900-1.	*Average for* 10 *Years.*
Measles	34	74	76
Scarlet fever	160	67	101
Diphtheria and croup	264	278	395
Whooping cough	136	88	105
Typhoid fever	214	288	250

Tuberculosis showed a marked decrease from an average of 1,550, for 5 years previous to the discovery of and protective efforts against the infective cause, to 1,427. Isolation hospitals, bacteriological laboratory and medical inspection of schools are cogently specified elements essential for successful contention against infectious diseases.

Abstracts of the annual reports of county health officers, and annual reports of the health of towns by the local health officers, indicate a very complete equipment in the personnel of the health service throughout the State, and much creditable work.

Vital statistics for 1901: Births, 20,294; rate per 1,000 population, 22.3; marriages, 7,112; divorces, 511. Deaths, exclusive of (948) still births, 14,856—1,512 less than in the preceding year. Death rate per 1,000 population (908,355), 16.2. Percentage of total mortality from classified causes: General diseases, 30.62; nervous system, 12.47; circulatory apparatus, 7.41; respiratory system, 13.17; digestive apparatus, 11.59; genito-urinary apparatus and its adnexa, 6.86; puerperal state, .82; skin and cellular tissue, .73; organs of locomotion, .12; malformations, .70; early infancy, 6.28; old age, 2.78; affections produced by external causes, 5.27; ill-defined, .81.

DELAWARE.—Bulletin of the Pathological and Bacteriological Laboratory of the State Board of Health for April, 1903.—Changes in the Board:

Dr. DeWitt, a prominent physician of St. Georges, was appointed by the Governor to fill the vacancy in the Board occasioned by the death of Dr. I. S. Vallandigham. The terms of Dr. John W. Clifton, of Smyrna, and of Dr. Edward Fowler, of Laurel, have expired, and the vacancies will be filled by the Governor.

Pure Water Supply for Wilmington.—The people of Wilmington are to be congratulated that they are to have a pure water supply. An engineer has already been engaged to draw up the necessary plans and specifications for a modern sand filter of about four

acres capacity. A maximum of forty bacteria per cubic centimeter is guaranteed by the constructing engineer. Since the raw water contains an average of about 4,000 bacteria per cubic centimeter this means an efficiency of about 99 per cent. The assurances are gratifying, but the most gratifying outlook lies in the fact that the operations of the filter will be kept under strict scientific supervision. A bacteriologist will be employed and a laboratory established.

An experimental filter will at once be built, with the view of determining the character of sand best adapted for the work, and that no mistake may be made upon the larger plant. When the filter is in operation daily bacteriological and bi-monthly chemical analyses will be made, and no water will be turned into the mains which is not up to the required standard of excellence. This will mean that the people of Wilmington, rich and poor alike, may drink their fill of water with peace of mind, and with no fear that it may contain disease germs. Although the expense will be great considered from a single standpoint, the benefits in time will compensate for it. We may hope to have thirty less funerals a year, to say nothing of the prevention of five times as many cases which result in recovery. Furthermore, a pure water supply will make homes. No one in his senses would preferably select as a place Wilmington a more desirable place of residence for those seeking for a home a town having bad water. Many kinds of manufactories require clear water, and would prefer not to be forced to filter it themselves. Thus a pure water may stimulate industry to a considerable degree.

All in all the benefits will be considerable and far-reaching, and we feel confident that in time every citizen of Wilmington who may now either oppose or show indifference to the scheme of water filtration, will be included among its most enthusiastic advocates.

DISTRICT OF COLUMBIA, 298,019—90,973 colored. Deaths during the week ending April 25, 127—51 colored; death rates, white, 15.2; colored, 27.3: 19.0, as against 22.1 for the previous week. There were 3 fatal cases of grippe, 2 of typhoid fever, and 1 of diphtheria.—The cases of typhoid fever brought over from previous week were 63. New cases numbering 10 were reported and 17 discharged, leaving 56 cases under medical supervision at the close of Saturday last. Deaths from consumption, 19; pneumonia, 15; disease of the kidneys, 11; heart disease, 9.—Contagious diseases reported: Typhoid fever, 9; diphtheria, 6; smallpox, 1.

ILLINOIS.—Chicago, 1,885,000. Bulletin for April, 1903: Death rates computed on estimated populations of 1,885,000 for 1903 and of 1,820,000 for 1902:

	April, 1903.	*March,* 1903.	*April,* 1902.
Total deaths, all causes	2,628	2,713	2,272
Annual death rate per 1,000	16.96	16.95	15.18
Males	1,527	1,577	1,300
Females	1,101	1,136	972
Under 1 year	435	453	401
Between 1 and 5 years	333	275	248
Over 60 years	505	573	463
Principal causes of death—			
Acute intestinal diseases	99	94	79
Apoplexy	54	58	43
Bright's disease	147	142	121
Bronchitis	131	127	99
Consumption	283	280	217
Cancer	82	80	79
Convulsions	67	73	66
Diphtheria	47	49	41
Heart diseases	169	207	200
Influenza	20	61	12
Measles	70	22	8
Nervous diseases	141	132	128
Pneumonia	604	582	428
Typhoid fever	33	49	16
Scarlet fever	32	30	74
Smallpox	9	8	—
Suicide	38	52	32
Violence (other than suicide)	101	101	112
Whooping cough	40	42	22

April, 1903, has been a punishing month. The total, 2,628, deaths recorded represented only partly the amount of sickness during the thirty days. Not since the year following the great fire of 1871—when a large proportion of the population was huddled together in hastily improvised barracks or crowded in quarters far beyond their normal capacity, and when scores of thousands flocked to the city, bringing with them all manner of diseases—has there been such a general prevalence of the graver maladies. But in April, 1872, the 756 deaths represented an annual mortality rate of 25.20

per 1,000 of the population, while the rate of this last April is only 16.96 per 1,000. The difference represents, among other things, the greater vital resistance of the present generation as a result of years of improving sanitary conditions and environments, and much also is due to the improvement in medical skill and practice which has been made during the last thirty years.

Only pneumonia remains as the opprobrium of the medical profession. Its treatment, notwithstanding more than one vaunted anti-pneumococci serum, is as unsatisfactory as ever, while its increasing ravages make all other acute infectious diseases relatively insignificant.

Of the total of 2,628 deaths for the month, 604 were caused by pneumonia and only 283 by "the great white plague." This is an excess of 113.4 per cent. of pneumonia deaths over consumption deaths, and while the deaths from consumption have increased 30.4 per cent. in actual numbers over those of April, 1902, the deaths from pneumonia have increased 41.1 per cent. this April over last.

INDIANA.—The State Board Bulletin for March shows there were 2,959 deaths in March, a rate of 13.8. In the corresponding month of last year the rate was 14.2. Deaths by important causes were: Pulmonary tuberculosis, 384; other forms of tuberculosis, 48; typhoid fever, 55; diphtheria, 25; scarlet fever, 11; measles, 7; whooping cough, 24; pneumonia, 402; diarrhœal diseases, 21; cerebrospinal meningitis, 18; influenza, 88; puerperal fever, 11; cancer, 92; violence, 120; smallpox, 28. As compared with the corresponding month of last year an increase appears in influenza and violence. In all other diseases there is a decrease. Of the total deaths, 438, or 15 per cent., were under one year of age, and 797, or 28.8 per cent., were 65 and over.

Morbidity.—The order of diseases prevalence was as follows: Influenza, smallpox, rheumatism, bronchitis, pneumonia, tonsillitis, scarlet fever, pleuritis, measles, typhoid fever, whooping cough, intermittent fever, erysipelas, diphtheria and croup, diarrhœa, inflammation of bowels, puerperal fever, dysentery, cerebrospinal meningitis, cholera infantum, and cholera morbus.

Smallpox.—873 cases of smallpox with 28 deaths were reported in 54 counties. In comparison with March of 1902, there was an increase of 30 per cent. in area invaded, of 4 per cent. in number of cases, and 1300 per cent. in deaths.

MASSACHUSETTS.—Boston, 594,246. Statement of deaths for February, 1903, 950—239 under five years of age. Death rate, 19.18.—Principal causes of death: Whooping cough, 18; diphtheria, 13; grippe, 33; tubercle of the lungs, 103; cancer, 37; cerebral congestion and hemorrhage, 52; organic diseases of the heart, 80; bronchitis, 36; broncho-pneumonia, 56; pneumonia, 96; nephritis, 31; Bright's disease, 23; senile debility, 20.—Cases of infectious diseases reported: Chickenpox, 23; cerebrospinal meningitis, 3; diphtheria and croup, 123; tuberculosis, 74; measles, 54; scarlatina, 121; smallpox, 20; typhoid fever, 33.

MICHIGAN.—Report of vital statistics for 1900. The principal facts summarized are:

Total number of deaths, 1900	33,778
Deaths per 1,000 population, 1900	14.0
Total number of marriages, 1900	23,295
Persons married, 1900	46,590
Persons married per 1,000 population, 1900	19.2
Total number of divorces, 1900	2,418
Persons divorced per 1,000 population, 1900	2.0
Total number of births, 1900	43,699
Births per 1,000 population, 1900	18.1

From pulmonary tuberculosis there were 2,018 deaths, corresponding to a death rate of 83.4 per 1,000 of population—a considerable decrease from 1899-1898, 2,018, 2,098 and 2,153, respectively, dropping per 100,000 population from 91.6 in 1898 to 87.9 in 1899. and, as stated, to 83.4 in 1900.

MINNESOTA.—Minneapolis, 240,000. Registry of deaths for March, 1903: Deaths, 238—516 under five years; annual death rate, 11.7. Deaths from typhoid fever, 19; tubercle of the lungs, 30; other forms of tuberculosis, 4; diphtheria and croup, 2; smallpox, 2; cancer, 15; pneumonia and broncho-pneumonia, 37; Bright's disease, 19.

St. Paul, 175,000.—Report for March, 1903: Deaths, 175—40 under five years; death rate, 12.0; deaths from typhoid fever, 3; diphtheria, 1; tuberculosis of the lungs, 12; tuberculosis, 24; la grippe, 4; smallpox, 1; nephritis, 10; pneumonia and broncho-pneumonia, 31; cancer, 8.

MISSOURI.—St. Louis, 645,000—40,000 colored. Report for March, 1903: Total deaths from all causes, 1,071—252 under 5

years; death rate, white, 18.54; colored, 40.8: 29.31. Deaths from smallpox, 1; measles, 17; scarlatina, 5; diphtheria and croup, 16; whooping cough, 10; typhoid fever, 20; phthisis, 114; bronchitis, 43; pneumonia, 148; Bright's disease and nephritis, 39; cancer, 40; senility, 58; violence, 67.

For the year ending March 31, 1903: Population, 520,000. Deaths, 10,303—3,548 under 5 years. Death rate, 19.08.—Deaths from measles, 26; scarlatina, 79; diphtheria and croup, 371; whooping cough, 34; typhoid fever, 215; diarrhœal diseases, 681—570 under five years; phthisis, 984—9.7 per cent. of total mortality; pneumonia, 879—8.5 per cent. of total mortality.

NEW JERSEY.—Hudson County (Jersey City and environs), 421,692. Report for March, 1903: Total deaths, 656—180 under 5 years. Death rate, 18.7. Deaths from scarlet fever, 3; diphtheria and croup, 18; whooping cough, 2; typhoid fever, 1; phthisis, 84; bronchitis, 12; pneumonia, 121; still births, 63.

For the year 1902 (409,810): Deaths, 7,486—2,666 under 5. Death rate, 18.3. Deaths from smallpox, 15.1; measles, 30; scarlatina, 64; croup and diphtheria, 242; whooping cough, 48; typhoid fever, 61; malarial fevers, 16; diarrhœal diseases, 219; cerebro-spinal fever, 2: all zymotic diseases, 1,003.—Marasmus, 226; phthisis, 793; bronchitis, 189; pneumonia, 881; la grippe, 6; railroad injuries, 102; drowned, 60; violence (total suicides and accidents) 399; still births, 167.

Newark, 266,000. Report for the week ending May 2: Deaths, 102—27 under 5 years; death rate, 19.94. Deaths from scarlet fever, 1; la grippe, 1; phthisis, 18; cancer, 3.—Contagious and infectious diseases reported: Diphtherian-croup, 14; scarlet fever, 8; typhoid fever, 8; cancer, 3.

OHIO.—Sixteenth annual report of the State Board, for the year ending Oct. 31, 1901.—The leading subject is on the smallpox epidemic, of which THE SANITARIAN maintained contemporary trace by abstracts from the Board's bulletins for the period. —The statistical reports of local boards of health summed up are for the calendar year ending December, 1901. The total number of cases of smallpox reported for the year was 4,880, with 58 deaths. Excepting Cleveland, the bulk of the cases occurred in villages and rural districts where vaccination had been neglected and the authorities were not prepared to promptly deal with first cases. The total number of deaths reported from all causes (ex-

clusive of 2,349 still births) was 34,447—7,337 under five years. The population (census 1900) was 2,737,504: death rate, 12.59. Deaths reported from zymotic diseases, 5,856: 16.9 per cent. of total mortality. Of this, 1,143, equal to 3.3 per cent. of the total mortality, was from typhoid fever.—From consumption the total number of deaths reported was 3,632: 10.5 per cent of the total mortality. From bronchitis, pleurisy and pneumonia there were 3,949 deaths: 11.5 per cent. of the total mortality. Appended is the Fifth Report of the Investigation of the Rivers of Ohio as Sources of Water Supplies: 150 pages with charts and diagrams, comprising information of great importance and practical utility to the authorities of the cities and towns throughout the State, who would understand the danger of polluted drinking water and how to prevent it.

OREGON.—The recently appointed State Board of Health, consisting of Drs. A. C. Smith, Harry Lane and Woods Hutchinson, of Portland; Dr. J. C. Smith, of Pendleton; Dr. Alfred Kinney, of Astoria; Dr. J. B. Pickel, of Medford, and Dr. E. A. Pierce, of Salem, held its first meeting at Salem, March 14, and organized by the election of Dr. A. C. Smith, president; Dr. Alfred Kinney, vice-president, and Dr. Woods Hutchinson, secretary and State health officer.

PENNSYLVANIA.—Philadelphia, 1,349,712. Report for week ended April 25, 1903: Deaths, 526—132 under five years. Deaths from consumption, 73; pneumonia, 70; nephritis, 18; heart diseases, 45; typhoid fever, 18; diphtheria, 14; whooping cough, 10; smallpox, 1; cancer, 21.

Pittsburg, 354,000. Report of the Bureau of Health for week ended May 2, 1903: Deaths, 161—54 under five years; annual death rate, 23.65. Deaths from typhoid fever, 10; whooping cough, 5; diphtheria and croup, 4; measles, 3; smallpox, 5; tuberculosis, 15; pneumonia, 17; bronchitis, 6; cancer, 4.

Cases of infectious diseases reported: Smallpox, 24; diphtheria and croup, 13; scarlet fever, 21; typhoid fever, 56; cerebrospinal fever, 1.

PORTO RICO, 953,947. Superior Board of Health reports for March, 1903: Total deaths, 1,950—706 under five years. Death rate, 22.2; still births, 98. Deaths from cerebrospinal fever, 22; diphtheria, 4; typhoid fever, 5; pneumonia, 52; grippe, 14; puerperal fever, 10; diarrhœal diseases, 15; anemia, 507; bronchitis,

68; tuberculosis, 132; heart diseases, 37; accidents and violence, 21.

WASHINGTON.—Seattle, 115,000. Report for March, 1903: Total number of deaths, 86—7 under five years. Death rate, 8.88. Deaths from pulmonary consumption, 11; pneumonia, 11; typhoid fever, 4; heart disease, 4; Bright's disease, 6.

CUBA.—Havana and environs, 275,000—72,000 colored. Report for March, 1903: Total number of deaths, 436, 9 less than in the previous month. Death rate, 20.44. No case of yellow fever, imported or otherwise, has been recorded since February. With the present month of March eighteen months have been completed since a case of yellow fever has originated within the territory of the Cuban Republic, notwithstanding the introduction of eight cases imported from Veracruz, Tampico or Progreso. Deaths from tuberculosis, 89; bronchitis, 17; broncho-pneumonia, 18; pneumonia, 9; infantile diarrhœa, 27; Bright's disease, 11; cancer, 15.

PHILIPPINES.—Both plague and cholera on most recent reports are on the increase. Of the former there were in Manila, during the month of February, 18 cases and 13 deaths. Cholera is most prevalent in the southern portion of Luzon and in the southern islands at many points.

FREE TREATMENT FOR EYE DISEASES IN RUSSIA.—Commercial Agent R. T. Greener writes from Vladivostock, February 15, 1903: A Russian charitable association is sending out traveling parties of oculists to render free assistance to persons of small means. During the three months of one party's stay at Habarofsk and Vladivostock, 504 persons received free treatment and 164 operations on eyes were performed.

MINERAL LAKE IN SIBERIA.—Commercial Agent R. T. Greener writes from Vladivostock, October 8, 1902: About fifteen miles from Ujoora, in the Atchinsk district, is situated a small lake, Utchoom by name, the waters of which have been found to contain curative properties. They are especially efficacious in the cure of wounds, rheumatism, scrofula, catarrh, skin diseases, and nervous disorders. The water is of a bitter, salty taste.

CANDIDATES FOR ADMISSION INTO THE PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

TREASURY DEPARTMENT:
BUREAU OF PUBLIC HEALTH AND MARINE HOSPITAL SERVICE,
WASHINGTON, D. C., April 30, 1903.

A Board of Officers will be convened to meet at the Bureau of Public Health and Marine Hospital Service, 3 B street, S. E., Washington, D. C., Monday, June 15, 1903, for the purpose of examining candidates for admission to the grade of assistant surgeon in the Public Health and Marine Hospital Service of the United States.

Candidates must be between twenty-two and thirty years of age, graduates of a reputable medical college, and must furnish at least two testimonials from responsible persons as to their professional and moral character.

The following is the usual order of the examinations: (1) Physical. (2) Oral. (3) Written. (4) Clinical.

In addition to the physical examination, candidates are required to certify that they believe themselves free from any ailment which would disqualify for service in any climate.

The examinations are chiefly in writing, and begin with a short autobiography of the candidate. The remainder of the written exercise consists in examination on the various branches of medicine, surgery and hygiene.

The oral examination includes subjects of preliminary education, history, literature, and natural sciences.

The clinical examination is conducted at a hospital, and when practicable candidates are required to perform surgical operations on a cadaver.

Successful candidates will be numbered according to their attainments on examination, and will be commissioned in the same order as vacancies occur.

Upon appointment, the young officers are, as a rule, first assigned to duty at one of the large marine hospitals, as at Boston, New York, New Orleans, Chicago, or San Francisco.

After five years' service, assistant surgeons are entitled to examination for promotion to the grade of passed assistant surgeon.

Promotion to the grade of surgeon is made according to seniority, and after due examination as vacancies occur in that grade.

Assistant surgeons receive sixteen hundred dollars, and surgeons twenty-five hundred dollars a year. When quarters are not provided, commutation at the rate of thirty, forty and fifty dollars a month, according to grade, is allowed.

All grades above that of assistant surgeon receive longevity pay, ten per centum in addition to the regular salary for every five years' service up to forty per centum after twenty years' service.

The tenure of office is permanent. Officers traveling under orders are allowed actual expenses.

For further information, or for invitation to appear before the Board of Examiners, address

WALTER WYMAN, *Surgeon-General,*
Public Health and Marine Hospital Service, Washington, D. C.

SANITARY CONGRESS AT BRADFORD.—The Department of State has received from Ambassador Choate, of London, under date of March 4, 1903, notice that the council of the London Sanitary Institute has arranged to hold, in conjunction with the local authorities in Bradford, a congress from July 7 to 11, 1903, for the purpose of discussion of various matters connected with public health. Official delegates have been appointed by various municipal authorities throughout the United Kingdom to attend the meeting, and the council will be pleased to welcome any representatives of the United States Government. The subjects to be discussed will include matters of international importance in connection with hygiene. The sections of the congress are: (1) Sanitary science and preventive medicine; (2) engineering and architecture; (3) chemistry, physics, and biology. An exhibition of apparatus and appliances relating to health and of domestic use will be held in connection with the congress. Tickets for the congress are 1 guinea ($5.11) each, to be obtained at the office of the local secretary, Town Hall, Bradford, or of the Institute, 72 Margaret street, London W.

INTERNATIONAL HEALTH RESORT EXPOSITION.—This international exposition is to be held at Vienna September 12 to October 20. Panoramas and views, plastic representations and other interesting details of information in regard to the watering places and health resorts of the world will be exhibited, with displays of the waters, arrangements for sanitation and amusements, etc.

BOOK REVIEWS.

A SYSTEM OF PHYSIOLOGIC THERAPEUTICS. Edited by SOLOMON SOLIS COHEN, A.M., M.D., Senior Assistant Professor of Clinical Medicine in Jefferson Medical College; Physician to the Jefferson Medical College Hospital and to the Philadelphia, Jewish and Rush hospitals; one time Professor of Medicine and Therapeutics in the Philadelphia Polyclinic, etc. Volume V: "PROPHYLAXIS," "PERSONAL HYGIENE," "CIVIC HYGIENE," "CARE OF THE SICK." By JOSEPH MCFARLAND, M.D., Professor of Pathology, Medico-Chirurgical College, Philadelphia; HENRY LEFFMAN, M.D., Professor of Chemistry in the Woman's Medical College, Philadelphia; ALBERT ABRAMS, A.M., M.D. (University of Heidelberg), formerly Professor of Pathology, Cooper Medical College, San Francisco; and W. WAYNE BABCOCK, M.D., Lecturer on Pathology and Bacteriology, Medico-Chirurgical College, Philadelphia. Pp. 539. Illustrated. Philadelphia: P. Blakiston's Son & Co., 1903.

This is a most interesting volume, comprehending an epitome of what is essential in the Natural History of Medicine—the origin, dissemination and prevention of disease. It is divided into three parts. The first, on the "Origin and Prevention of Disease," is by Drs. McFarland and W. W. Babcock. Here are discussed very thoroughly the etiological factors concerned in the production of disease: Immunity, microbic infection, age, sex, heredity, nervous influences, abnormalities of development, auto-intoxications, physical causes, heat, light, cold, electricity, the atmosphere, climate and season. Poisons are very completely summarized and thoroughly discussed; and their relationships to the general problems of disease outlined. Under the head of sociologic causes, the authors speak of density of population, dissipation, sexual excesses and occupation.

A particularly interesting chapter is that on the extrinsic causes of disease, in which a thorough presentation of the organic factors, those of animal and vegetable origin, is given. The diffusion of disease in various ways—by the air, water, food and soil, and how the body is invaded by micro-organisms, is thoroughly treated. There are, besides, short chapters on the different diseases due to animal and vegetable parasites.

In Part II, the subject of "Civic Hygiene" is discussed by Dr. Henry Leffman. It is a very thorough and readable presentation of how a city should be sanitarily policed, what to do with the garbage and sewage, and the requirements of plumbing and ventilation. Part III, by Dr. A. Abrams, discusses personal hygiene and the care of the sick.

Altogether, it is an admirably adjusted work to the needs of medical practitioners. That is to say: preventive medicine in its just relation to curative medicine as a means of curing as well as preventing disease, and replete with diagnostic knowledge of material things and conditions in conflict with health.

DISEASES OF THE HEART AND ARTERIAL SYSTEM. DESIGNED TO BE A PRACTICAL PRESENTATION OF THE SUBJECT FOR THE USE OF STUDENTS AND PRACTITIONERS OF MEDICINE. By ROBERT H. BABCOCK, A.M., M.D., Professor of Clinical Medicine and Diseases of the Chest, College of Physicians and Surgeons (Medical Department of the Illinois State University), Chicago; Attending Physician to Cook County Hospital and Cook County Hospital for Consumptives; Consulting Physician to Mary Thompson Hospital, Hospital of St. Anthony de Padua, and of Marion Sims Sanitarium; Fellow and formerly President of the American Climatological Association; Member of the American Medical Association, etc. Pp. 874, with three colored plates and one hundred and thirty-nine illustrations. Bound in cloth. Price, $6.00. New York: D. Appleton & Co.

This work is based upon extensive observation and thorough mastery of the subjects of which it treats. Alike to the most important needs of the student and for the most facile use of the medical practitioner, all mere theories and speculations have been omitted from consideration; and only so much of the anatomy and physiology of the circulatory organs appertaining to their healthy conditions as deemed necessary to a better understanding of the matter in hand has been described, because an extended consideration of them was believed to be out of place in a work devoted to diseased conditions.—"Although aware that physical signs are properly a part of the symptomatology of disease and should be considered under that head, still the author has thought it best to consider them separately, for the sake of facilitating the knowledge of that most difficult subject, the diagnosis of cardiac disease."

Special attention is paid to treatment—following careful diagnosis—throughout. The author evidently having availed himself

of the gist of extensive research in this regard, in addition to his own practical knowledge, by which his work, as compared with other treatises on the same subject, is pre-eminently resourceful for remedial measures.

INFECTIVENESS OF MILK OF COWS WHICH HAVE REACTED TO THE TUBERCULIN TEST. By JOHN R. MOHLER, A.M., V.M.D., Chief of the Pathological Division Bureau of Animal Industry. Bulletin No. 44, U. S. Department of Agriculture, Washington, D. C.

A brochure of ninety-three pages, comprising the history, care and study of a herd of tuberculous cows, disinfection and isolation. Meanwhile a study of the infectiousness of the milk was pursued, with feedings and injections of the milk to guinea pigs.—A "synopsis of positive results obtained from the feeding and inoculation experiments, as well as from the microscopic examination of the centrifugalized sediment of milk and cream, indicates that one or more of the guinea pigs fed with milk from 9 different cows have succumbed with typical tuberculosis; that is, the milk of 16.07 per cent. of the 56 reacting cows has been found to be pathogenic to guinea pigs when fed to them. Of the experimental animals inoculated intra-abdominally in the first series, at least 1 guinea pig has died of tuberculosis in each of the 6 different instances, showing that the milk of 10.9 per cent. of the 55 reacting cows in this experiment has proven fatal to guinea pigs in the first inoculation experiment. In the second series of intra-abdominal injections the milk from 7 individual cows out of 45 examined, or 15.5 per cent., was demonstrated to possess virulent tubercle bacilli. By uniting these inoculation results it will be observed that 11 out of 55 cows, or 20 per cent., secreted milk which transmitted tuberculosis to one or more experimental animals when injected into the peritoneal cavity.

"The combined results of the ingestion and inoculation experiments show that the milk of 12 out of 56 reacting cows, or 21.4 per cent., has at one time or another since the beginning of the experiment contained virulent tubercle bacilli.

"Specimens of the mammary glands from all the above-mentioned cows were brought to the laboratory and histological examination made, but without finding any indication of tuberculosis.

"The result of this investigation demonstrated fully the necessity for thorough sterilization of the milk from reacting cows before it was consumed as food, and precautions of this nature were

at once observed by the asylum authorities. The danger to the consumer of this raw milk seems palpable, although it is not assumed to be in direct proportion to the positive results obtained in such susceptible animals as guinea pigs."

STUDIES ON THE DIGESTIBILITY AND NUTRITIVE VALUE OF BREAD AT THE UNIVERSITY OF MINNESOTA IN 1900-1902. By HARRY SNYDER, B.S., Professor of Chemistry, College of Agriculture, University of Minnesota, and Chemist, Agricultural Experiment Station. Bulletin No. 126. U. S. Department of Agriculture. Fifty pages.

A valuable contribution to the differentiation in the digestibility of bread depending upon the different kinds of flour of which it is made.

"The results of these investigations are in accord with those obtained in former studies, and indicate that fine patent flours from both hard and soft wheat are more digestible than corresponding coarse flours, though they contain somewhat less protein and mineral matter pound for pound. The investigations also show that all flours are quite thoroughly digested, and furnish experimental proof of the generally recognized fact that wheat flours of all grades are among the most important articles of diet."

MANUAL OF INTERNATIONAL CLASSIFICATION OF CAUSES OF DEATH.—Adopted by the United States Census Office for the Compilation of Mortality Statistics, for use beginning with the year 1900, prepared under the supervision of WILLIAM A. KING, Chief Statistician for Vital Statistics, United States Census Office.

As a guide to the proper tabulation of mortality statistics, this manual should be a table book to every board of health registrar throughout the country; and its forms should be observed as the most certain means of correct returns.—Medical Education in Vital Statistics, Instruction of Medical Students in Registration Methods, etc.—Relation of Physicians to Mortality Statistics, The International Classification of Causes of Death adopted by the United States Census Office and approved by the American Public Health Association.—Legislative Requirements for Registration of Vital Statistics, The Necessity for Uniform Laws, Methods and Reforms.—Practical Registration Methods: emanating from the Census Bureau, are also educational bulletins of practical utility to all health officers and others interested in vital statistics.

CONTEMPORARY LITERATURE.

THE LOUISIANA PURCHASE AND THE RISE OF THE UNITED STATES.

The international effects of the Louisiana Purchase were even more significant than its political effect. From it dates the end of the struggle for the possession of the Mississippi Valley and the beginning of the transfer of the ascendency in both Americas to the United States. Even the English veterans of the Napoleonic battles were unable to wrest New Orleans from Andrew Jackson in the War of 1812. The acquisition of Florida, Texas, California, and the possessions won by the United States in the recent Spanish-American War are in a sense the corollaries of this great event. France, England, and Spain, removed from the strategic points on our border, were prevented from occupying the controlling position in determining the destiny of the American provinces which so soon revolted from the empire of Spain. The Monroe Doctrine would not have been possible except for the Louisiana Purchase. It was the logical outcome of that acquisition. Having taken her decisive stride across the Mississippi, the United States enlarged the horizon of her views and marched steadily forward to the possession of the Pacific Ocean. From this event dates the rise of the United States into the position of a world power.—From "The Significance of the Louisiana Purchase," by Frederick J. Turner, in the "American Monthly Review of Reviews" for May.

"STORY OF THE BIRTH OF NEW YORK."

To anyone taking even a bird's-eye view, the contrast between the Dutch settlement on the point of the Island of Manhattan in 1653 and the New York of to-day is tremendous. To one who knows nothing of New York save its name it may be said that the city of to-day spreads over three hundred and twenty-seven square miles, and houses in its five boroughs something over three millions of people. In the Dutch village of New Amsterdam there were less than three hundred homes and not twelve hundred people. Nevertheless, the charter that was granted to those twelve hundred people meant a great deal to them, and it means much to the present-day city, dating its birth from that morning when the people assembled to the beating of drums to listen to the first reading of the charter granting them municipal rights.

The houses of New Amsterdam were for the most part rude wooden structures, quaint in appearance and homely in arrangement, with tall, slanting roofs absurdly steep, surmounted by

weathercocks. They stood with gable end to the street, and to the door of each was attached a knocker combining the ornamental and the useful, as it was usually formed of some strangely devised animal head. Some few buildings were of yellow and black brick, placed so as to form fantastic designs, and having fixed to them figures of iron that chronicled the date of their erection. Some few, too, were of stone, but they were rare indeed, and witnessed to the dwelling-place of wealthy townsmen.

It was at the Feast of Candlemas, in the year 1653, that Governor Stuyvesant proclaimed the new city. But with the stubbornness, the belief in the justice of his measures, the absolute determination to be governor in fact as well as in name that marked him, he would not follow the directions of the Dutch West India Company under whom he held office. He refused to permit the people to elect their officers, and simplified matters very much by appointing them himself. After he had appointed them he told them as briefly as might be, and with a force that could not be misunderstood, that though they held office it would be well for them to understand that his own power as governor was not thereby one whit lessened. He explained that he would preside at all their meetings and advise them in all matters, both great and small. So, although the city got its charter, it was a boss rule from the start, a precedent from which New York was to suffer many and many a time thereafter, often struggling in the grasp of far less capable and honest men than Peter Stuyvesant.—From "Story of the Birth of New York," by Charles Hemstreet, in "The Churchman," May 2, 1903.

WHAT ARE WE?

We belong to a nation of "great readers." We devour popular novels with an unfailing appetite and a literary range which extends from the known to the unknown and does not necessarily discriminate greatly between Mrs. Ward and Bertha M. Clay.

We are fast becoming an out-of-doors people. Not only our heroines and heroes of fiction but our "real folks" sigh continually for "the open." Nature, to many of us, is a deity to be approached with bared head, thick shoes, and rolled-up sleeves; to be propitiated with golf clubs and fishing rods; to be entertained with athletic sports of varying kinds and degrees; and in return for our devotion she bestows on us a hearty appetite for beefsteak, and lends increased zest to a soothing pipe in hours of meditation or stupor.

We are a practical people, much inclined to believe that there are few things in heaven or earth which cannot be reduced to a scientific formula.

Yet outside this world of superficiality and robustness and "common sense," there is another universe whose meanings no formulas can ever express, whose bounds can never be measured by sea or star or space, a world of immortalities that differs from the other as "the consecration and the poet's dream" differ from the multiplication table, and it is as true of this world as of the other that "to him that hath shall be given."—Mrs. Martha Baker Dunn, in the May "Atlantic."

OVERWORRY NOT OVERWORK.

One of Many Reasons Why College Girls Need Stimulus of Athletics.

College girls sometimes break down. So do society butterflies, and wage-workers, and hundreds of other girls who have not the wisdom or experience to establish a just relation between their physical incomes and outgoes. But it is overworry much oftener than overwork that sends the college girl or her non-collegiate sister into nervous prostration. Just here is the saving grace of athletics, that sugar-coated ounce of prevention that prevents the bitter pound of cure. In the rush and whirl of some exercise that uses every muscle and requires each instant the judgment of an alert mind, there is no room for the little blue demon of worry that eats into the foundations of health; the perplexing problem is forgotten; the player gains her poise and takes up the next task with a freshened brain.

The physical benefits of judicious athletics are almost axiomatic. But they are not all. In the education of girls the incidental lessons of college contests are not to be despised—the value of patient work for an uncertain end, the sweetness of effort for the class, the grateful weariness of victory, and the pleasure of a just reward.—From Alice Katharine Fallows's "Athletics for College Girls," in the May "Century."

THE BROAD JUMPER.

Go at It Systematically to Get the Best Results.

Every schoolboy thinks that he can broad-jump, and so he can to a certain degree. But this event is one which should be gone at systematically to get the best results. The jumper should first carefully notice his stride on going up to the take-off, so that he

can mark off a distance (say 25 yards back), and by stepping on this mark with one of his feet as he runs by he will be sure to strike the take-off when he comes to it. The jumper cannot be sure of getting his best efforts into his jump unless he is practically sure of hitting the take-off. After this has been acquired, the athlete can get to work.

In this run the jumper's highest speed should be reached at about 10 or 12 feet before the take-off, so that he can gather himself for the jump. After leaving the take-off he should shoot out and up. He must have elevation or his efforts will be in vain. He should go into the air at an angle of at least 45 degrees. A good way to get this elevation is by placing a hurdle in the jumping-pit and jumping over it. The jumper should gather himself together as he goes through the air, and at the finish, just before alighting, he should force himself on by a spasmodic effort with his arms and body. The legs should also be held forward so that they will strike the ground at the farthest possible distance. Practice will show how far out the feet can be thrown without the athlete's falling back into the pit. It must be remembered that the greater the speed the farther out the feet can be thrown with safety. A great deal of practice is necessary to become a good broad jumper, but this is an event which it is not well to practise too frequently, as it is very hard on the legs. The broad jumper will therefore not expect to get at his best during the first season.—From G. W. Orton's "Training for Interscholastic Athletics," in May "St. Nicholas."

THE IDEAL NURSE.

A nurse generally arrives in time of crisis, the patient is turned over to her, the family draw a long breath of comfort and relief, confide in her amazingly, question her about the doctor, the treatment, the patient's condition, her experience in similar cases, and unhesitatingly make her privy to their most personal affairs. . . .

Besides possessing unblemished courage and professional skill, a nurse should be prepared to sweep, keep a room in order, arrange flowers, read aloud, write notes, unobtrusively quiet such family jars as might affect her patient. She must understand what to do herself, what should be left to servants, remembering that this will vary in every household. She must be quick to see when her presence is necessary, when she is in the way. She can allow herself no personal habits as to bed or board, no private existence or amusement while at a case, and when the patient is safely through the exciting period of illness, she has to settle down with good

grace to the tedium of convalescence, never resenting the inevitable withdrawal of intimacy as the family resume a normal habit of life, and no longer make her the recipient of every thought and emotion.—Mary Ross, in the May "Atlantic."

CHILDREN WERE CHEAP.

In a Scotch church an old minister, who was very deaf, was very anxious to introduce some new hymn books into the church, and asked his precentor to give out the notice immediately after the sermon. The precentor, having a notice of his own, gave out that members of the congregation wishing to have their children baptized were to send their names into the vestry. The old minister, thinking that it was the notice about the hymn books, stood up, and said:

"And I wish to say, for the benefit of those who have not any, that they may be had in the vestry any afternoon, between the hours of 3 and 4. Ordinary little ones at a shilling each, and special little ones, with red backs, at one and three."

"Don't you go an' git sorry fer yerself. That's one thing I can't stand in nobody. There's always lots of other folks you kin be sorry fer 'stid of yerself. Ain't you proud you ain't got a hare-lip? Why, that one thought is enough to keep me from ever gittin' sorry fer myself."—From "Lovey Mary," "The Century."

PROCTOR'S ATTRACTIONS.

Notwithstanding the fact that spring is rapidly turning to summer, the quality and quantity of the attractions at Mr. Proctor's various houses have not changed, nor will they change in the general excellence that has become characteristic of the various companies. Many sterling comedies have been negotiated for the summer season, and among these several that have not been produced in this country as yet. In the vaudeville field many big novelties and feature acts have been engaged for the summer season. Mr. Proctor's New York City houses are now undergoing alterations whereby they will be the coolest theatres in town when the hot season comes.

The forthcoming revival of "On the Wabash," at Proctor's Fifth Avenue Theatre, promises to be a notable one, alike as to its cast and in the elaborateness of the stage settings. It will be interesting, also, as bringing back to Broadway this very popular play by

Joseph Arthur, who in this piece forsook the exciting field of melodrama for the quieter walks of rural comedy.

One of the best known aspirants for stellar honors in the theatrical world this season is Miss Lottie Williams, a comedienne who has achieved fame from Maine to California in a variety of parts from "Little Eva" to "Juliet." The vehicle for which she is the magnet this season is a new sensational comedy drama entitled "Only a Shop Girl," from the pen of Marie Wellesley Sterling, author of "On the Suwanee River," etc. The play deals with life as we know it to-day, among the masses employed in the big department stores of the larger cities, and the trials and temptations of our young people of the present generation who are subjected to the wiles and pitfalls of New York City.

HE NEVER SPOKE AGAIN.

The following story is told of a ventriloquist, now famous, but at the time of this happening so hard up he used to walk between cities where he was to appear. On one of these tours he came to Philadelphia on foot, and on the road he picked up a miserable little dog "because it looked so much like he felt." The story will explain what became of the dog.

The first house he came to was a saloon, and, of course, he wanted a drink. He had no money, but went in anyway to see what he could do. The proprietor, a German, said:

"Well, what will you have?"

He said: "I'll take a little whisky," and then, turning to the dog, he asked:

"What will you have?"

"I'll take a ham sandwich."

The German was so surprised he almost fainted. He looked at the dog a moment, and then asked:

"What did you say?"

"I said a ham sandwich."

Hans thought it wonderful that a dog should be able to talk, and asked who had trained him, how long it had taken, etc., and wound up with:

"How much you take for him?"

"Oh," said Mr. Ventriloquist, "I wouldn't sell him at any price, but I am a little hard up now, and if you will lend me $50 I'll leave him with you till I bring the money."

"All right," said Hans. "I just want him for a little while, so I can show him to some smart people I know around here."

So everything was settled, the money paid, etc., and as the ventriloquist went out he turned and waved his hand to the dog and said:

"Well, good-bye, Jack. I'll come back soon."

"You mean son-of-a-gun, to sell me for $50 after all I've done for you! So help me, Moses, I'll never speak another word as long as I live!"

And he didn't.—"Philadelphia Times."

LITERARY NOTES.

Hyperchlorhydria, A Symposium.—The June issue of the "International Medical Magazine," E. B. Treat & Co., 241-243 W. 23d St., New York, will be devoted to a symposium on this most important gastric subject, than which none more important has ever been published in any American journal. More than half a dozen of the leading European specialists will contribute, among whom are: Prof. C. A. Ewald, Berlin; Prof. George Hayem, of Paris; Prof. Carl von Noorden, of Frankford; Dr. L. Kuttner, of Berlin; Prof. Rosenheim, of Berlin.

The selection of contributors from this side of the Atlantic has been equally happy, and the following will take part: Prof. John C. Hemmeter, of Philadelphia, on "An Experimental and Clinical Study of the Etiology of Hyperchlorhydria." Dr. Allen A. Jones, of Buffalo, on "The Effervescence Test for Gastric Acidity." Dr. Boardman Reed, of Philadelphia, on "A Further Development of the Benedict Effervescent Test of Gastric Acidity." Dr. John A. Lichty, of Pittsburg, on "The Relation Between Hyperchlorhydria and Neurasthenia." Prof. Fenton B. Turck, of Chicago, on "The Treatment of Hyperchlorhydria." Dr. A. Robin, of Newark, Del., on "The Etiology of Hyperchlorhydria." Dr. Max Einhorn, and others.

THE ABBEY PRESS, of 114 Fifth avenue, New York, has just published a book by Miss Sarah Willard Howe, entitled "Oberammergau in 1900," which is the result of her trip abroad in that year. It is fully illustrated by pictures representing those who actually took part in the Passion Play performed that year.—Will also shortly issue a collection of religious and philosophical poems

entitled "Wreaths of Song," by the Rev. T. J. O'Mahony, D.D., All Hallows College, Dublin, Ireland.

BULLETINS, REPORTS, REPRINTS, ETC., RECEIVED.

Accumulation of Gas in Acute Suppuration of the Middle Ear. H. A. Alderton, M.D., Brooklyn, N. Y.

Adenoids, a Case of with Malaria. Walter G. Chappel, M.D., New York.

Traumatism During Adenoid Operations. *Ibid.*

Remarks on Intranasal Operations. *Ibid.*

Aneurysm of the Heart with Thrombosis of the Left Coronary Artery. Judson Daland, M.D., Philadelphia.

Adirondack Cottage Sanitarium, Eighteenth Annual Report. Edward L. Trudeau, M.D., Physician in Charge, Saranac Lake, N. Y.

Collective Investigation Concerning the Value of Silver-nitrate Injections in the Treatment of Pulmonary Consumption. Thomas J. Mays, M.D., Philadelphia.

Commerce of Latin America. Philadelphia Commercial Museum, Philadelphia.

Diphtheria, Treatment of. J. W. Pearce, La Grange, N. C.

Does the Practice of Medicine Pay? Geo. R. Patton, M.D., Lake City, Minn.

Factors in the Ordinary Treatment of Eye Diseases. James Cole Hancock, M.D., Brooklyn, N. Y.

Headaches Due to Eye Strain. *Ibid.*

Trachoma. *Ibid.*

Facts, Fancies and Fallacies in the Treatment of Consumption. M. J. Brooks, M.D., New Canaan, Conn.

Gastrojejunostomy with the McGraw Elastic Ligature for the Relief of Gastroptosis. H. O. Walker, M.D., Detroit, Mich.

Gonorrhœa. F. J. B. Cordeiro, M.D., U. S. Navy.

Hysterectomy in Puerperal Septic Infection. Chas. Jewett, M.D., Brooklyn, N. Y.

Hyoscine in the Treatment of Morphinists. George E. Pettey, M.D., Memphis, Tenn.

Inaugural Address, Medico-Legal Society. Clark Bell, Esq., New York.

Giant Magnet, The, in Ophthalmic Surgery. Leartus Connor, Detroit, Mich.

Influence of the Cervical Sympathetic Upon the Eye, with Two Cases of Paralysis. William Cheatham, M.D., Louisville, Ky.

Keys to Success, The. Lecture by Edward Bok, from "Modern Eloquence." John D. Morris & Co., Philadelphia.

Metastatic Carcinoma of the Chorioid. E. L. Oatman, M.D., Brooklyn, N. Y.

Plastic Artificial Vitreous in Mules' Operation. *Ibid.*

Perineal Prostatectomy. Parker Syms, M.D., New York.

Pelvic Deformity in New York City. James Clifton Edgar, M.D., New York.

Periduodenal Abscess Secondary to Ulcer of the Duodenum. William Seaman Bainbridge, M.D., New York.

Some Problems of Preventive Medicine. Burnside Foster, M.D., St. Paul, Minn.

Prognosis and Treatment of Suppurative Pleurisy. E. Fletcher Ingals, M.D., Chicago, Ill.

Quarantine Laws and Regulations of the United States. Revised edition.

Public Health and U. S. Marine Hospital Service. Washington, D. C.

The Early History of Quarantine. *Ibid.*

Origin of Sanitary Measures Directed Against Yellow Fever, by P. A. Surg. J. M. Eager. *Ibid.*

Renal Decapsulation for Chronic Bright's Disease. George M. Edebohls, M.D., New York.

Regulations for the Sale of Viruses, Serums, Toxins, and Analogous Products in the District of Columbia, etc. U. S. Public Health and Marine Hospital Service, Washington, D. C.

Sanatorium Treatment of Consumption. S. G. Bonney, M.D., Denver, Col.

Sanitary Measures for the Prevention of Tuberculosis in New York City. H. M. Biggs, M.D., New York.

Tuberculosis, The Conflict with. John H. Lowman, M.D., Cleveland, Ohio.

Tuberculosis, 30 Pictures: Communicable, Preventable, Curable. Addison W. Baird, M.D., New York.

Tumors, Benign, of the Naso-Pharynx. Francis J. Quinlan, M.D., New York.

Vaccine Virus, The Bacteriological Impurities of: An Experimental Study. M. J. Rosenau, Director of Hygienic Laboratory, U. S. Public Health and Marine Hospital Service, Washington, D. C.

Vessels as Carriers of Mosquitoes, by P. A. Surg. L. B. Grubbs. *Ibid.*

SANITARY SCIENCE.

A SYNOPSIS OF SANITARY SCIENCE AS REPRESENTED IN THE SANITARIAN, ALPHABETICALLY.*

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